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ABSTRACT

This set of papers deals with the integration and maintenance of disabled children in regular Australian classrooms and the mounting pressure on teachers to provide effective instruction for an increasingly broad range of ability groups. Part I is concerned with theoretical issues and research on the integration of children with special learning needs. It begins with a discussion of the classification and labeling of children and an historical overview of Australian integration. Following chapters address: theoretical and practical aspects of early intervention, problems associated with finding suitable placement for children experiencing early learning difficulties, and the impact of teachers influence on the placement and education of high-risk children in regular classrooms. Part II addresses curriculum and management issues, with papers that demonstrate the value of a structured teaching program by incorporating precise definition of teaching objectives and a mastery-learning procedure. The papers review research in the area of reading; describe methods for teaching spelling, handwriting, and basic mathematics; outline computer applications; provide guidelines for managing inappropriate behavior; document correspondence between a first-year resource teacher and her former lecturer on selection of a reading model for a primary school; and discuss preparation of older children for the post-school period. (JDD)

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EDUCATING CHILDREN WITH SPECIAL NEEDS IN REGULAR CLASSROOMS:

An Australian Perspective

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EDUCATING CHILDREN WITH SPECIAL NEEDS IN REGULAR CLASSROOMS: AN AUSTRALIAN PERSPECTIVE

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FOREWORD

It is now accepted that the vast majority of children with special educational needs can be maintained successfully within the regular school system, given that it provides an adequate level of resources, a supportive environment and skilled and sensitive teaching. Ostensibly this is not an enormous problem; the proportions of children with severe disabilities are relatively small, perhaps amounting to 1-2 per cent in the general school population. However, in addition to these there are considerable numbers who will require special educational services at some time in their school lives and who can present very difficult problems for instruction and management. Estimates of the prevalence of this group are controversial but the figure of one in five has been suggested on several occasions. What is very clear, however, is that, unless substantial efforts are made, many children will have both an unrewarding school experience and a significant reduction in their future life opportunities. The diversity of problems represented here include mild retardation, learning difficulties, poor socialization, inadequate language and communications skills, hearing and visual impairments and behaviour disorders. All of these may be compounded by such factors as an impoverished environment, both at home and at school.

Over the years many attempts have been made to designate children with special educational needs, mostly with a view to allocation of resources rather than to enhance their educational opportunities. Such terms as 'educable mentally retarded', 'slow learning', 'educationally subnormal', 'developmentally delayed', 'culturally deprived', and 'poor children' have all been applied and enjoyed a temporary fashion. The groups represented here can be subdivided clinically and educationally in many ways but what they undoubtedly have in common is that the children represented in them are either out of touch, or becoming out of touch, with their peers in the educational mainstream. Thus they may be experiencing major difficulties in their school work, their emotional and social development and their participation in expressive, creative and recreational activities. Without wishing to proliferate the existing terminology, therefore, a designation which could be used for all such children is that they are socio-educationally marginal. Their marginality would be increased, of course, if they were placed in a segregated institution or special faculty which might have the effect of denying full access to normal educational contacts and opportunities.

Socio-educational marginality, then, relates very much to schools and the educational practices within them, since it is these which may identify children as failing to reach expected standards in academic achievement and personal adjustment. It follows, therefore, although the problem is rarely formulated in this way, that one role of the regular school is to reduce the proportion of its children who are at any one time marginal; the role of special education is to assist in this process. If a segregated or partially segregated form of service is considered necessary, this must aim at providing the most advantageous form of environment, with a view towards eventual mainstream placement.

The education of marginal children occurs in a complex matrix of family, school and community factors but may be seen as part of a formal system of service delivery. The process involved includes early identification and intervention, if necessary; entry to school under supportive conditions; appropriate methods of teaching; and management and preparation for employment and adult life. This is an important social endeavour which requires continuous input from research and development if it is to be effective; hence the vast amount of technical literature which attempts to translate basic research into practice.

What follows is a series of papers which aim to contribute to understanding and technical

developments in the area of children with special educational needs. In a broad sense, the theme is socio-educational marginality, but the contributors have been encouraged to approach problem areas in their own way. Typically, however, the papers either review a topic with reference to recent research carried out in Australia or present an overview of theoretical and technical developments in specific areas. It is anticipated therefore, that they will be of interest to special education and other resource personnel and, in view of the topicality of the integration issue, to teachers in the regular classroom.

The present volume is representative, in large part, of the special education staff and post-graduate students at Macquarie University: the approach is therefore unashamedly one of translating research into useful practice. However, subsequent collections will range more widely over the growing productivity and experience of Australia workers, both in research and the delivery of services.

J. Ward
Macquarie University
December, 1986.

PREFACE

This book is about the education of children who have been variously described as educationally disadvantaged, slow learning, minimally or mildly intellectually impaired, learning disabled or educationally marginal. Estimates of their numbers in the population of school-aged children vary, but have been as high as twenty percent. Indeed, in a recent paper, Thorley and Mills (1986) suggested that this group could include, at some time in their education, all those children whose IQ scores fall between 55 and 85. If this is as suggested, their numbers could then be as high as 15% of children in regular schools.

In recent years, one of the major trends that has characterized special education in Australia has been the growing awareness of the rights of all children, and particularly those in the groups described above, to be educated in as normal a setting as possible. In some states, this has been interpreted as placement in special classes, usually attached to regular schools, for all or a major part of their education. In other parts of Australia, it has resulted in the development of a variety of service models designed to maintain students with special learning needs as far as possible in regular classrooms. Over time, increasing value has been placed on the latter, rather than the former model, particularly by the Commonwealth Schools Commission in its funding arrangements. As a result, by the mid 1980's, pressures have been exerted upon education systems across Australia to provide appropriate services for children with mild and even moderate problems in learning that will ensure both their integration *and* continued maintenance in regular classrooms throughout their years at school.

Another influence that has had growing impact on education systems in Australia during the 1980's is the expectation that all children in regular schools should achieve at least minimal standards of literacy and numeracy. This objective has resulted in a growing demand for accountability in education, as well as mounting pressure on teachers to provide effective instruction for the increasingly broad range of ability groups which have been placed in their classrooms. This volume comprises a set of papers that are concerned with various aspects of these two issues. It presents the views of educators who are currently involved in both relevant research and the teaching of children with special learning needs in regular classrooms in Australia. Some of the papers were written specifically for this volume, while others were originally prepared for another purpose, such as conference presentation. Earlier drafts of Chapters 6 and 10, were published in the *NSW Journals of Special Education* (Bochner, Salamon & Richardson, 1985; Lloyd & Goyen, 1986). All have been selected for inclusion because they provide some insight into an aspect of the problems faced by teachers in regular schools who have children with learning problems in their classes. The primary objective underlying preparation of the collection is to provide a set of relevant readings as a resource for use at universities, colleges of advanced education and other locations in courses which aim to provide regular classroom teachers and other support personnel with appropriate skills for teaching children with special learning needs. The book should, therefore, be of interest both to practising teachers who are interested in recent developments in this field in Australia, and to teachers in training (pre-service, in-service and post-graduate) who have a particular interest in the problems presented by this group of children.

The book is divided into two parts. The papers included in Part I are largely theoretical, concerned with issues that are frequently addressed in teacher education courses in both special and regular education, as well as a selection of reports on recent research related to the integration of children with special learning needs into Australian schools. Part II comprises a set of more practical papers on aspects of curriculum and program implementation.

Apart from Chapter 4 which reports data from a study of social skills training with young Down's Syndrome children, a broadly non-categorical approach is taken throughout the book. This means that individual chapters are not organised around the traditional categories of impairment or disability (e.g. the deaf, the physically handicapped or the emotionally disturbed), although we would see all the children with these disabilities as needing additional support in the classroom. Rather, the aim of the book is to contribute to the processes by which teachers may acquire the instructional expertise to assist all children with difficulties, irrespective of aetiology,' to attend, to persist, to behave, to focus, to identify, to learn how to apply rules and to handle abstract and symbolic material' (Thorley & Mills, 1986,p.7).

It is worth noting that while the orientation that influenced the selection of material for the book did not centre on one theoretical model in preference to another (e.g. a behavioural model rather than a psychodynamic one), there was an underlying assumption that, where possible, preference should be given to papers that demonstrated the value of a structured teaching program, incorporating precise definition of teaching objectives and a mastery-learning procedure. It is argued that this type of approach to teaching children with problems in learning should help to ensure that all, including the less competent, achieve at least minimal standards in basic skills such as reading and number, during their years at school.

As the focus of the book is the integration and maintenance of disabled children in regular classrooms, it begins with a discussion of issues in the classification and labelling of children and an historical overview of Integration with particular reference to Australia. The next three chapters address theoretical and practical aspects of early intervention which may be regarded as a necessary prerequisite to facilitate the integration and maintenance of marginal children in regular classrooms. Thus Center, in Chapter 3, provides a review of the development and efficacy of early intervention while Chapter 4 by Pieterse and Cairns and Chapter 5 by Bochner, Price and Salamon report the results of two intervention programs designed to increase the social and language skills respectively of groups of high risk pre-school children. The problems associated with finding suitable placement for children experiencing early learning difficulties are highlighted in Chapters 6 and 7. Bochner, Salamon and Richardson report on the progress at school of a group of children who had earlier encountered difficulties in acquiring appropriate language skills while Cooper and Bochner review the characteristics of another group of children placed in a special class, following severe difficulties in learning within a regular classroom.

In contrast to the focus of earlier chapters, the chapters by Center and Price are concerned with the impact of teachers' influences on the placement and education of high risk children in regular classrooms. Chapters 8 presents results from a recent survey of the attitudes of teachers and principals in N.S.W. schools to the integration of children with disabilities while Chapter 9 reports results from a study of the language used by teachers with such children in the classroom. Overall, the nine chapters in Part I of the book examine a range of issues associated with the preparation and placement of children with special learning needs into regular schools.

Curriculum and management issues, as they relate to children with special learning needs in regular classrooms are addressed in the second part of the book. An overview of recent research in the area of reading is presented by Lloyd and Goyen in Chapter 10, and in Chapter 11, Badenhop examines the teaching of spelling to children who have learning disabilities. While both these chapters review current theoretical debates in these curriculum areas, some conclusions are also drawn that have practical implications for classroom teachers. Caka, Cooper and Bochner's chapter on handwriting is directly concerned with

classroom practice. It provides a description of the procedures that were followed in the remediation of difficulties in cursive handwriting in three children. Outhred and Center consider issues associated with achieving mastery in basic mathematics skills for all children in regular classes. Both these chapters (12 and 13) exemplify the highly structured, data-based approach to teaching, which underlies much of the work that is reviewed in this volume.

The remaining chapters in Part II are aimed at practising teachers and provide some useful suggestions for classroom organisation and management. Outhred's chapter provides a useful review of possible applications of computers in classrooms with slower children. The use of computers with such groups is a rapidly developing field and could prove to have a significant impact on learning outcomes. In Chapter 15 Martin outlines a number of ideas that can be effective in handling disruptive behaviour in classrooms. This chapter is written from a behavioural viewpoint and within this framework sets out some proven methods for overcoming inappropriate behaviour. The following chapter by Jardine comprises a very practical, if sometimes light-hearted, collection of letters exchanged between a resource teacher in her first appointment, and her former tutor. Their discussion highlights the way in which the results of research may be used to guide classroom practices. This chapter should have great interest for teachers who want to ensure that all the children in their charge achieve at least basic literacy skills.

Finally, as an epilogue, Parmenter, provides a brief look at some of the issues involved in preparing older children with poor learning skills for the post-school period. This chapter is included as a very brief introduction to the problems involved in the transition from school to work.

From the preceding, very brief overview of the contents of this volume, it is evident that there are a number of omissions in the topics covered. For example, the focus of children with mild problems in learning, without reference to specific impairments and disabling conditions (apart from Chapter 3) means that there is no discussion of issues related to the education of children with specific handicapping conditions, such as the deaf, the blind or the emotionally disturbed. Many of these children fall into the groups of mildly or even moderately impaired who have been identified as the subject of the book, though their particular difficulties may mean that their teachers should have additional, more specialized skills (e.g. knowledge of braille). Similarly, there is no simple paper that addresses the needs of other special groups, such as the gifted, or children from non-English speaking backgrounds. The role and needs of parents in the educational process is also only addressed fleetingly while a number of curriculum areas (e.g. music or natural and social science) are omitted altogether. Similarly, it is recognized that there is an overwhelming bias towards information and research projects from New South Wales. Constraints from lack of space, but more particularly from lack of access to suitable material, have meant that many subjects which should have been included in a volume of this type are missing. While this lack is acknowledged, the authors hope that further collections of a similar type will overcome these omissions.

Finally, this collection should be regarded as a set of working papers on topics related to the education of children with mild learning problems. They are presented as a stimulus to thought and discussion, rather than as definitive statements about the current state-of-the-art in special education. The authors hope that their work will be accepted in this light, and trust that the reader will find the collection useful and a stimulus to more effective teaching of these 'problem' children who deserve a chance to progress with their peers, in a normal school environment.

ACKNOWLEDGMENTS

When a book such as this is produced, the result is somewhat more than the mere sum of its parts for both its editors and its readers. In attempting to co-ordinate divergent views and styles into a cohesive whole the editors have been forced to draw upon a wide range of previously untapped skills. For the reader, a topical theme has been enriched by the breadth of experience brought to it by a large number of contributors. We thus owe a tremendous debt of gratitude to the following contributors who bore editorial harassment with stoic patience:

> Anne Badenhop; Yena Caka; Bryce Cooper; Judy Goyen; Joan Jardine; Trevor Lloyd; Meredith Martin; Trevor Parmenter; Penny Price; Jenny Richardson and Linda Salamon.

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The Editors

Chapter 1

WHO SHOULD RECEIVE SPECIAL EDUCATION: ISSUES IN IDENTIFICATION, CLASSIFICATION AND INCIDENCE

Sandra Bochner

Some of the major problems facing those concerned with the provision of specialized education services for children who have difficulties in learning, are encompassed in four broad questions: ***Who should receive special help at school? What are the children's difficulties? How many children are involved? What help is appropriate?*** The first three of these questions are considered in the following sections of this chapter. The final question is addressed in later chapters in the book. In this chapter, the process of identification is considered first. Systems used to categorize disabilities that affect learning are then discussed and the incidence of children requiring special education services in Australia is reviewed. Finally, a functional approach to the classification of such children in Australian schools is proposed.

1. IDENTIFICATION:

Who should receive special help at school? The identification of children who will require extra help in school has troubled educators for decades. Those children whose difficulties are severe to profound in nature and organically-based are usually identified at an early age, either at birth or soon after, as their failure to master developmental milestones becomes evident. This group includes those with severe sensory (deaf/blind), physical, psychiatric, intellectual and biological (epileptic, diabetic) impairments. These disabilities are usually quantifiable in terms of standardized, physiologically-based tests, continue life-long and occur at a low but relatively consistent rate in the population (around 4%). They have been termed 'high severity-low prevalence' (Levine, Carey, Crocker & Gross, 1983). If appropriate treatment (e.g. anti-convulsant drugs, insulin) and/or protheses (e.g. hearing aids, wheelchairs) are provided, the impact of the disability on some of these children's schooling may be minimal. However, not all severe impairments can be treated by such procedures and those children with severe sensory, physical and intellectual disabilities usually require highly specialized educational services often provided in a special rather than a regular school.

In contrast, children described as 'low severity-high prevalence' whose difficulties are relatively mild and often hard to quantify are frequently not identified until they fail to achieve at the level of their normal peers. Many of the children are classified as mildly mentally retarded, learning disabled, and emotionally disturbed (Edgar & Hayden, 1984-5). Their reported incidence in different school districts in the U.S.A. varies widely but estimates have ranged as high as 15% (Tucker, Stevens & Ysseldyke, 1983). This group includes children whose difficulties can be remediated at school, though it also includes children whose problems appear to be exacerbated by poor or inappropriate schooling. Since the proportion of children in this group from disadvantaged or minority backgrounds is usually high, it may be argued that these children's difficulties are, frequently environmental rather than organic in origin (Ysseldyke, Algozzine & Richey, 1982).

Children with speech and language difficulties can also be described as 'low severity-high prevalence'. They are fairly readily identifiable using standard assessment procedures and their incidence is also fairly consistent (3-4% of school-age children) though the number identified has been shown to vary with the number of speech pathologists available in a region (Edgar & Hayden, 1984-5). While problems of this type usually disappear as the children mature, there is evidence that many continue to have related difficulties throughout their schooling (see Bochner, Salamon & Richardson, this volume; Fogelman, 1983; Fundudis, Kolvin & Garside, 1979; Silva, McGee & Williams, 1983). Overall, it may be concluded that most of the special education services provided within regular schools cater for children with 'low severity-high prevalence' impairments that are, in the main, difficult to diagnose and likely to present differently at each stage in the children's education.

If an impairment is not detected at birth, it appears to be parents who most often first recognize that a child has a developmental or learning problem. For example, according to Messum, Gibson and Bell (1983), parents are the most common source of referrals to a N.S.W. community health assessment centre (27%), followed by other referring agencies such as baby health centres (25%) and general medical practitioners (14%). More than half of the children referred (58%) are under school age. The most frequent primary presenting problems are moderate (19%) or mild (16%) intellectual impairment followed by developmental delay (11%), though over half of the children showed evidence of at least one (52%) or more (18%) other problems, including communication difficulties (9%), epilepsy (8%), cerebral palsy (7%) and behaviour problems (7%). The Warnock Report, in a major review of special education provisions in the United Kingdom, acknowledged the role of parents in the identification process. Its first recommendation concerning the discovery of children needing special education services stated:

> *Information about child development and sources of expert advice on this subject should be more widely disseminated to parents and prospective parents, fathers as well as mothers (Warnock, 1978, p.739).*

As might be expected, data from long-term epidemiological studies of children's development (e.g. Fogelman, 1983; Rutter, Tizard & Whitmore, 1970; Werner, Bierman & French, 1971) suggest that some children with minor impairments are not identified in their early years, either by parents or other agencies. However, these children are often recognized by teachers, as there is evidence that during the early years of school, teachers can identify children experiencing problems in learning (Adelman & Feshback, 1971; Fogelman, 1983). Thus it is the adults most closely associated with high prevalence/low severity children, such as parents and teachers, who are likely to identify those who need special education services at school.

2. CLASSIFICATION AND INCIDENCE:

a) What are the children's difficulties?

Historically, definitions of handicap have been derived from a medical diagnosis and this origin continues to dominate in many classification systems currently used in special education. This is not surprising, since, as noted earlier, many impairments that handicap children's learning are organic in nature and quantifiable in terms of standardized assessment. However, these systems have proved to have only limited utility for educators who require a classification system that has more functional relevance for the classroom.

In considering the use of classification systems in special education, one of the first distinctions that is usually made concerns the origins of children's difficulties in learning: are they biologically-based (i.e. *endogenous* or *organic*) originating from genetic, biochemical, disease or traumatic sources, or do they result from environmental factors, such as inadequate nutrition or early institutionalization (i.e. *exogenous* or *non-organic*)? In fact this distinction is often difficult to maintain since many studies have demonstrated that, for some children, particularly those with low severity impairments, the impact of a known biological condition can be exacerbated by environmental influences (e.g. Fogelman, 1983; Neligan, Prudham & Steiner, 1969; Pringle, 1965; Rutter, Tizard & Whitmore, 1970; Sameroff & Chandler, 1975; Werner, Bierman & French, 1971). This suggests that both biological and environmental factors should be taken into account when children's impairments are categorized for educational purposes.

According to Cromwell, Blashfield and Strauss (1975), classification systems developed for use in health, education and welfare tend to be organized in terms of two basic types:

1. all members of a set are identified; for example, children who have the Trisomy 21 form of Down's Syndrome.
2. the characteristics or symptoms associated with a particular concept are described; for example, hyperactivity.

It could be argued that the first type is predominantly concerned with impairments that are endogenous, or biologically-based, while the second focusses only on the presenting behaviour of the children involved, which could result from environmental factors alone or from a combination of biological and environmental influences. While most classification systems used in special education include instances of both, the first type is most commonly represented, though educational administrators and teachers would find classification systems based on the second more useful in planning and providing services for children with learning difficulties.

Much of the debate in special education over the use of classifications is stimulated by awareness of the stigma that comes to be attached to many of the labels that are used (Goffman, 1963). Cromwell et al (1975) suggest that all classification systems should be reviewed at regular intervals, to ensure that they remain relevant in terms of changing community attitudes and that children are advantaged, not disadvantaged, by their use. In fact, the terms used to categorize children with special learning needs have tended to change over time, partly to reflect changes in knowledge, but also in order to reduce the impact of such stigma on the children involved. For example, children called *educationally subnormal* in the 1944 Education Act in England (Segal, 1967) were described as *mentally retarded* by the U.S. Office of Education in 1971 (Dunn, 1973) and as *mentally or intellectually handicapped* in more recent Australian reports (Andrews, Elkins, Berry & Burge, 1979; Doherty, 1982).

Sensitivity to the precise meaning of terms used in special education has led to a heightened awareness of the distinction that should be made between the terms impairment, disability and handicap (Cameron, 1982; Collins, 1984; Doherty, 1982). According to the World Health Organization's definitions (WHO, 1980), an ***impairment*** involves an abnormality of body structure, appearance or function, a ***disability*** reflects the consequence of an impairment in terms of a restriction or lack of ability to perform an activity in a manner that is considered to be normal, while a ***handicap*** is concerned with the consequences, cultural, social, economic or environmental, that may be experienced by an individual as a result of a disabling condition. Both impairments and disabilities are mainly biologically-based and reflect a deficit in the individual, whereas a handicap is considered to be attributable to the individual's environment. Collins (1984) suggests that medical or paramedical provision is required at the impairment level and welfare services when an impairment becomes a disability, whereas appropriate educational services are required to ensure that a disability does not become a handicap within a school context.

b) How many children are involved?

In 1978, The Commonwealth Schools Commission commissioned a survey of special education in Australia (Andrews et al, 1979). Known as the Schonell Report, this provided an estimate of the number of handicapped children in all regular and special schools across the country. In order to simplify the identification process, only five categories of handicap were used in the survey, all of which represented organically-based disabilities. However, principals in regular schools still had difficulty in identifying the number of handicapped children in their classes. The greatest problem was to distinguish mildly intellectually handicapped children from those with learning and behaviour difficulties. As a result, information about this latter group was sought in a separate survey, based on a sample of 800 regular schools only. Information provided by regular schools that responded to the survey, including pupils identified by the schools and by relevant professionals, demonstrated that approximately 2 per cent (58,000) of regular school students in Australia were recognized as having a handicapping condition. A further II.2 per cent (328,000) had learning difficulties and 3.2 per cent (96,000) had behaviour problems, though there could have been some overlap in these last figures. In all, the Schonell Report showed that over 12 per cent of children with special education needs, including a small number of children who were moderately to severely mentally disabled, were catered for in regular schools, with the largest proportion experiencing learning difficulties of some type. In addition, over 30,500 children with handicaps were in special schools and a further 21,000 in special classes and units not attached to regular schools (Andrews et al., p.297). No information was reported by Andrews et al. on the distribution of major disabilities in this latter group, but of the 283 special schools that responded to the survey's request for information, 67% provided a service for intellectually handicapped children, 11% for physically handicapped, 2.5% and 5.3% respectively for visually and hearing impaired, 3.9% for behaviourally disturbed or psychiatric and 2.1% for delinquent children. Almost 68% of these pupils exhibited only the major handicap specified by the school attended, while a further 20% had one and 7% more than one additional handicap.

The number of children in special schools who were known to have more than one major presenting handicapping condition may have contributed to the failure of the Schonell report to provide estimates of the rate of occurrence of the different categories of handicap for all Australian children. However, a recent New South Wales report (Doherty, 1982) did include estimates of the prevalence of 13 major handicapping conditions for children in that state, based on figures obtained from Andrews et al. (1979) and the Departments of

Health, and Youth and Community Services. These estimates, which appear to be based on a count of only one handicapping condition for each child, are set out in Table 1.

TABLE 1 Incidence of handicapping conditions for New South Wales population (4-18 years)

Handicapping Condition	Incidence
Learning problems	11.0
Behaviourally disturbed	3.2
Mildly intellectually handicapped	2.54
Moderately/severely handicapped	0.35
Hearing impaired	0.21
Orthopaedically handicapped	0.1
Delinquents	0.075
Visually impaired	0.07
Psychiatric or neurologically disturbed	0.05
Deaf/blind	0.003
State wards	0.05

Source: Doherty, 1982, 29.

It is interesting to note the inclusion here of delinquents and State wards, two groups of children whose difficulties are undoubtedly environmental rather than organic in origin. Children in these groups needing additional help at school are probably usually included in other categories such as emotionally or behaviourally disturbed, mildly intellectually handicapped or learning disabled.

Overall, data from these two recent Australian reports support the distinction outlined earlier between the 'high/low severity-low/high prevalence' groups of children identified as being likely to require special education services during their school years. However, the variation in labels used in these sources and the reported difficulty encountered in trying to establish the main presenting problem for the many children who have multiple difficulties highlight some of the problems associated with the use of traditional, organically-based classification systems in education. An additional limitation of these systems for educators is that not all children identified in these categories will need help at school; for example, the orthopaedically-handicapped child may only require appropriate walking aids to attend a regular school and the mildly intellectually handicapped child, with good teaching and resource help, may cope adequately in a regular classroom without special class placement. Moreover, data from two recent surveys of the attitudes of New South Wales school principals and teachers towards the enrollment of children with impairments (Center, this volume) demonstrate that principals may react more negatively to a handicapping category label (e.g. moderate intellectual handicap) than to the functional characteristics that are frequently associated with that category (e.g. short attention span, impaired language skills). What is required is a system for classifying children with impairments in terms of their functional characteristics and assessed needs at school, rather than their deficits, exogenous or endogenous.

3. A FUNCTIONAL SYSTEM FOR CLASSIFYING CHILDREN'S IMPAIRMENTS, DISABILITIES AND HANDICAPS

A number of problems were encountered during the 1976 Australian Census in relation to the reliability of information obtained concerning disabled and handicapped persons in the community. Much of this difficulty appeared to result from community misconceptions

about the meaning of the terms *impairment, disability* and *handicap*. As a result, prior to the collection of data for the review of handicapped persons in Australia (Cameron, 1982), the Bureau of Statistics developed a series of structured questions that could be used by household interviewers with no medical training to identify handicapped children and adults reliably. This procedure was based on a classification system which comprised twelve handicapping conditions (e.g. loss of sight, loss of hearing) and four broad areas of activity (e.g. self help, mobility) which these conditions could affect. When disabled adults or children were identified by interviewers using the structured questions, further information was sought to determine the level of assistance or supervision required by those persons to minimize the impact of their disability in each of the nominated activity areas. On the basis of this information, persons identified as disabled were classified in terms of type of disability, area of activity affected and level of severity of any handicap. As a result, in addition to data on the incidence rates of various types of disabling conditions in the community, information was obtained that could be used to determine the type and amount of assistance and supervision required by handicapped persons in different aspects of their daily life.

The classification system devised by the Australian Bureau of Statistics for its national survey (Cameron, 1982) could provide a basis for the development of a functional classification system for use in Australian schools. A grid developed around the categories identified in the survey is set out in Figure 1. Here the twelve main disabling conditions specified by the Bureau are listed down the left hand column while four areas of activity in which a disabled person may be handicapped are set out across the top. At the bottom of the grid are described four levels of severity, ranging from no handicap (1) to severe handicap (4) for each of the activity areas identified. These levels are defined in terms of the amount and type of assistance or supervision required if the handicapped individual is to function at a level as near to normal as possible in each activity area. The severity of a person's total handicap is determined as the highest level obtained in any of the identified activity areas.

An example of the use of the system described above is included in the two following case reports. First, on the basis of oral and written reports obtained from the child's parents, paediatrician, an assessment unit, audiology clinic, early intervention teacher and preschool director, it is determined that Ben, a 5 year old boy with a mild hearing loss and developmental delay, will require, on enrolment at school, no extra assistance or supervision in the areas of self care and mobility, but some help in the form of an hearing aid for communication, together with regular services on a sessional basis from a specially-trained teacher for help in basic skills. This information indicates that Ben may be classified as mildly handicapped at school, with greatest limitation in the areas of communication and basic skills. In contrast, based on information obtained from similar sources, Lisa, a 6 year old girl with spina bifida, is identified as being moderately handicapped in the area of self care (her parents are willing to take responsibility for these activities at school), mildly handicapped in mobility (uses a walking frame), has no communication problem and is mildly handicapped in a number of curriculum areas at school. Her teacher will require access to specialized materials and equipment, information and advice from specialist counsellors and additional support in the form of reduced class size or an aide. Overall, Lisa is moderately handicapped, with greatest limitation in the area of self care and some limitations in mobility and in basic skills and other areas at school.

The main advantage of a classification system of this type is that it enables a direct link to be made between an identified disabling condition, the areas of activity upon which that disability may impinge and the services required to ensure that the level of handicap

experienced by the disabled child in each area of activity is minimized. This therefore represents a functional system for classifying disabled children in terms of their specialized needs at school.

A final comment

Since the early seventies there has been an extraordinary expansion in special education provisions throughout the developed world. Where very limited services had been available to children whose difficulties were primarily organic in origin, efforts have been made to provide appropriate specialized services for the very large numbers of children with less obvious impairments who failed to progress satisfactorily within the regular school system. However, current problems, related to the education of children who do not fit into one of the defined disability categories for which provision has already been made, have forced educators to look for a different approach to the classification of children with special needs. One response has been to use 'catch-all' categories, such as 'learning disabled', based often on a process of exclusion (e.g. not blind, deaf or intellectually impaired) rather than inclusion (e.g. a specified degree of hearing loss or an IQ score between certain limits), for the many children whose problems do not fit within a recognized category. However, this solution has proved problematic, particularly for the children whose difficulties are of the 'low severity-high prevalence' type and has not proved any more meaningful within a school context.

Another proposal for overcoming the limitations of current classification systems is that all current categories in special education be abandoned in favour of an approach that uses no categories. However this solution is unrealistic, since it is inevitable that large numbers of children will be conceptualized in terms of shared characteristics. What is required is a way of classifying children in terms of their learning needs at school. Such an approach is represented in the functionally-based classification system outlined earlier in this chapter.

Finally, it may be argued that a new challenge for special education in the eighties and beyond is to develop a system for determining what assistance is required for children with special learning needs at school and to endeavour to provide such support, based on identified individual needs. This chapter has provided an overview of some of the issues underlying the development of such a system and one possible solution, based on a functional assessment of children's learning needs at school, was proposed. Hopefully this challenge will be met in Australia and a new model of special education classification and provision will be introduced into the school system, for the benefit of all children.

Figure 1 A system for classification of children with impairments and disabilities by type of disabling condition and area of handicap/limitation

Child's Name: _____

Date: _____

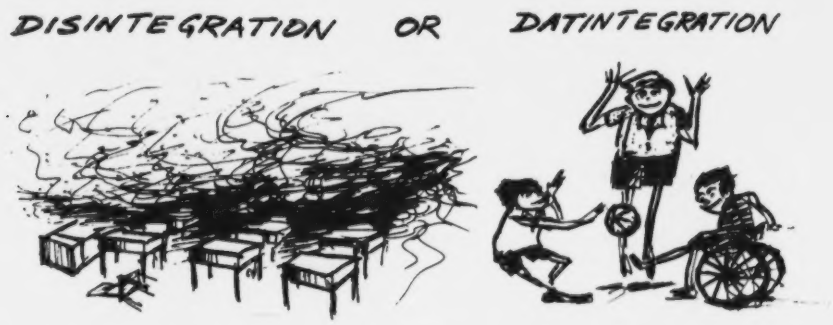
Area of Handicap/Limitation
(Indicate the scale of severity in each area of handicap by reference to the severity levels set out below)

Type of Disabling Condition	Self Care	Mobility	Communication	Schooling	
				Basic Skills	Other areas
(a) loss of sight (even when wearing glasses or contact lenses)					
(b) loss of hearing					
(c) speech difficulties in native language					
(d) blackouts, fits, or loss of consciousness					
(e) slowness at learning or understanding					
(f) incomplete use of arms or fingers					
(g) incomplete use of feet or legs					
(h) long term treatment for nerves or an emotional condition					
(i) restriction in physical activities or in doing physical work					
(j) disfigurement or deformity					
(k) need for help or supervision because of a mental disability					
(i) mental retardation, mental degeneration due to brain damage slow at learning & specific delays in development;					
(ii) mental disorders other than retardation, degeneration or slow at learning					

Level of Severity

Self Care	1.	***No self care handicap:*** If a child requires no assistance or supervision, experiences no difficulty and uses no aids in performing all these activities
	2.	***Mild:*** has no difficulty in performing these activities without personal assistance or supervision but uses an aid.
	3.	***Moderate:*** has difficulty in performing any of the activities without personal assistance or supervision.
	4.	***Severe:*** requires personal assistance or supervision to perform any of the activities.
Mobility	1.	***No mobility handicap:*** child requires no personal assistance or supervision, experiences no difficulty in performing all of the 'mobility activities', is not in a wheelchair and does not use any aids for moving around.
	2.	***Mild:*** has no difficulty moving around either familiar or unfamiliar places but uses an aid to do so, or has difficulty in performing one or more of the 'mobility activities' (i.e. cannot easily walk 200 metres; takes longer than other persons the same age to walk 200 metres; cannot or has difficulty walking up and down stairs without a handrail.
	3.	***Moderate:*** experiences difficulty using public transport, or in moving around either familiar or unfamiliar places without personal assistance or supervision or is in a wheelchair.
	4.	***Severe:*** cannot use any form of public transport or requires personal assistance or supervision to use public transport, or to move around familiar or unfamiliar places.
Communication	1.	No communication handicap: child has no difficulty in understanding or being understood by strangers and family or friends and does not use an aid for communicating.
	2.	***Mild:*** has no difficulty in understanding or being understood by other persons but uses a communication aid.
	3.	***Moderate:*** has difficulty understanding or being understood by strangers.
	4.	***Severe:*** cannot understand strangers at all; has difficulty understanding family or friends; cannot be understood by strangers at all; or has difficulty being understood by family or friends.
Schooling	1.	***No school handicap:*** special education services provided by the class teacher ***without additional*** resources.
	2.	Mild:
		(a) special education services provided by the class teacher ***with access to specialized instructional materials and/or equipment***
		(b) ***plus additional information and advice from specialist consultants and counsellors***
		(c) plus a full or part time specially-trained teacher (sometimes itinerant) who either ***provides support to teacher or withdraws on a sessional basis.***
	3.	***Moderate:***
		(a) ***special class placement on a full time or part time basis***, or
		(b) ***combination of regular and special school***, receives no academic instruction in a regular class
	4.	Severe:
		(a) ***special school***, or
		(b) ***special boarding school*** or residential facility.

Chapter 2



INTEGRATION—HISTORICAL PERSPECTIVES

Yola Center

INTRODUCTION

An historical overview of special education, or the systematic attempt to educate exceptional children, reveals a steady trend from rigid exclusion to progressive inclusion. From the time when abnormality was automatically considered to be the result of moral turpitude, handicapped children have gradually emerged, from complete neglect, from residential schools for the few, from isolated community settings and from special schools and classes into much more integrated arrangements (Reynolds & Birch, 1977).

The early history of education for exceptional children was, largely, a chronicle of overwhelming denial, neglect and rejection. The lives of tens of thousands of handicapped children were totally circumscribed through the belief that they neither could nor should be taught. It was not until the beginning of the 19th century that enlightened views of man's nature and origins propagated by scholars such as Locke and Darwin began to modify these repressive ideas. A further reduction in the discriminatory attitude towards exceptionality also occurred in Europe through the pioneering work of Itard, Seguin and Montessori with the mentally handicapped, and in the U.S.A by Gallaudet and Howe working with the deaf and blind respectively.

RESIDENTIAL SCHOOL MOVEMENT

The first special education programs designed to alleviate the gross neglect of the handicapped were established for deaf, dumb and blind children who had attracted the sympathy of humane, voluntary groups. Institutions for these children began to appear in the United Kingdom in the late eighteenth century, but it was not until 1893 that legislation was passed requiring local educational authorities to provide compulsory education for the sensorily disabled (Sutherland, 1981). Provision for mentally handicapped children was slower in coming and, for much of the early 19th century, English law did not distinguish between mental defect and mental disorder. Although the first separate institution for the mentally retarded was established in 1847, under the auspices of a voluntary committee convened for that specific purpose, legislation for the compulsory education of mentally handicapped children had not yet been enacted by the turn of the century.

In America the residential school movement in special education was spearheaded by the establishment of boarding schools for the deaf, blind and moderately retarded in 1817, 1829 and 1848 respectively (Dunn, 1973). By 1850 the institutional school movement was expanding rapidly and, by the beginning of the 20th century, over 30 states were providing public boarding schools for the moderately sensorily and intellectually handicapped population. These residential units became the modus operandi for servicing many handicapped children, even when compulsory education laws were being enacted across the

states, since they provided a placement for those children for whom a special day school or regular class program was unavailable.

In Australia, the unique needs of hearing impaired were considered as early as 1860, when the Institutions for deaf and dumb children were opened by voluntary associations in Sydney and Melbourne. An education program for the blind was added in the Sydney institution in 1869, while a separate group had set up a school for the blind in Victoria in 1867. By 1898, several State and one private charitable institution catering for the mentally handicapped were also functioning and including teachers in their early staff appointments (Andrews, Elkins, Berry & Burge, 1979). As selection for residential admission was based on a medical diagnosis, both the institutions and their teaching staff tended to be narrowly categorical in orientation. Today, however, residential schools cater primarily for that minority of profoundly or moderately handicapped children for whom a less restrictive provision is either unsatisfactory or unavailable (Ward, Bochner, Center & Ferguson, 1984).

DAY SCHOOL MOVEMENT

The establishment of residential institutions for discrete categories of exceptional children contributed, paradoxically, to the systematic movement away from educational separation for the handicapped. With the advent of compulsory education laws in Western countries, leaders in public day schools became aware of the formal educational programs developed in some of these institutions and approached them for assistance in providing appropriate education for mildly handicapped children enrolled in regular schools (Reynolds, 1976). Thus, gradually, through most of the first half of this century, special day schools and classes were established in many of the developed countries throughout the world. As these fledgling day school programs for special children were initially dependent on the residential school for curriculum leadership and teacher training, the special knowledge accumulated in a segregated environment was able to be slowly disseminated into the community.

However. these early community-based day programs and the mildly handicapped children they served were not readily acceptable to the general education system. For the first half of the 20th century, admission to such programs was for a minimum period only. Within the regular class, exceptional children generally had no other option but to repeat successive grades, a procedure which exaggerated their already marked deviance. However, even temporary removal to special or opportunity classes while providing a less threatening educational environment, only served to reinforce the pejorative labelling to which these children were constantly exposed. Moreover, when educational budgets were constrained, as during the depression in the thirties, school systems everywhere were not geared either philosophically or economically to expand or improve the few special class programs already in existence (Reynolds, 1976). In an era in which general education itself was restricted to the acquisition of basic skills, it was inevitable that large numbers of exceptional children were left in an educational wilderness.

THE MOVEMENT TOWARDS INTEGRATION (1945-1970)

In the aftermath of World War II, a tremendous burst of activity began on behalf of handicapped children, as if to counteract the previous massive rejection they had experienced. In the United States, the number of children placed in special classes in public schools increased by 260% between 1945 and 1958 (Love, 1972) and there was a corres-

ponding increase in the number of colleges and universities offering special education courses. At the same time, parents of exceptional children began to organize pressure groups, like the United Cerebral Palsy Association, The National Association for Retarded Citizens and the American Foundation for the Blind, to demand access to educational resources other than institutionalization for their handicapped offspring (Bricker, Seibert & Casuso, 1980). Across the Atlantic, the English Education Act of 1944 mandated 'equality of educational opportunity' and subsequently defined eleven categories of handicap for which local educational authorities were constrained to make educational provision (Segal, 1967). The need for special teacher services was also recognised but provision for teacher training was relatively slower in being implemented.

In Australia, the immediate post-war period also witnessed a surge of activity in specialist education services by both government and voluntary agencies. An amendment to the Public Instruction Act of 1944 provided compulsory education for the blind and the infirm. It also established schools for specific purposes and registered appropriate non-government schools as certified special schools. State Education Departments, however, generally directed their attention to the education of the mildly mentally handicapped, a trend especially evident in the three most populous states—New South Wales, Victoria and Queensland (Andrews, et al., 1979). The response to such restriction of service delivery was the formation of voluntary organizations, composed mainly of concerned parents, to assist those groups of exceptional children for whom educational resources were not provided. By 1951, the Subnormal Children's Welfare Association had been established in New South Wales to promote the interests of moderately and severely intellectually handicapped children, whilst, even earlier, the unique needs of the orthopaedically handicapped and the cerebral palsied had been recognized by the efforts of the Crippled Children's Society and the Spastic Centre of N.S.W., respectively.

During this period, the unique contribution of the Schonell Centre in Brisbane to special education must also be acknowledged since, by 1952, it had begun to offer courses in remedial teaching to applicants from the eastern states of Australia and to provide the first diagnostic and teaching service in Queensland for children failing in the basic skill subjects (Andrews, 1983). Thus, by the end of the sixties in Australia, there existed a number of privately established and state-run government special schools for children with discrete handicapping conditions, state-run special classes had been increased by over 100% and courses for training teachers of the deaf and mentally retarded had been formally established in several colleges.

Reynolds (1976) characterized the development of services up to 1970 as quantitative rather than qualitative in nature, geared more to simple models of the past than to the ideological and technological advances characteristic of the seventies. However, although this period was somewhat sterile in terms of service provided to children it was particularly prolific in fostering new directions in special education. In America, the immense impact of behavioural technology on the educational management of the disabled was already being felt. Furthermore, new perspectives were gained when special educators were exposed to the principles of normalization emanating from Scandinavia, which stressed the role of community structures and support systems in the education of the handicapped. At the same time in England, the Hester Adrian Research Centre was demonstrating, forcefully, the educational potential of mentally handicapped children and the resource potential of parents as educators (Cunningham & Sloper, 1977). Thus, by the beginning of the seventies, two emerging ideas could be discerned in special education:

1) that strategies existed by which exceptional children could be taught, and

2) that the local community could provide the necessary educational resources.

The principles of educational exclusion for the profoundly handicapped child and educational segregation for the atypical child were no longer defensible.

NEW DEVELOPMENTS IN SPECIAL EDUCATION

The burgeoning period of activity in the late sixties was also instrumental in releasing special education from its narrow diagnostic confines. Although special service delivery had been extended to the trainable retarded, to the deaf/blind and to the autistic, the greatest increase in special education enrolments came as a result of vigorous parental action in the late sixties, for those children suffering from 'a learning disability'. This was not an area considered to be a handicapping category in the traditional sense. However, it was a welcome inclusion within the special education rubric because it represented a radical departure from the overly simple medical and psychometric model of classification previously characteristic of special education placement. At about the same time as special educators were being exposed to this consequent *decategorization* of handicap there was a general consolidation of diverse programs of special education in single institutions; that is, for the first time in schools, colleges and many other agencies, children with different kinds of handicap were being brought together or studied under one roof. Thus it became possible to look at and work across all categories of exceptionality in children and consider the relationship between these categories.

During the late 60's established patterns of special education provision also began to draw their share of sceptism and even hostility (Reynolds, 1976). The exclusion of certain special needs students from the mainstream was trenchantly criticised by influential special educators in the U.S.A. such as Dunn (1968) who was disturbed by the disproportionate numbers of minority group children placed into classes for the retarded on the basis of narrow psychometric measures. The ensuing segregation/integration debate sparked by his paper generated innumerable evaluation studies whose methodology was sometimes questionable—and whose results were often conflicting (Valletutti, 1969). For every proponent of special schools for the atypical child there was an equally committed opponent who claimed that research evidence did not indicate any significant social or educational advantage in such segregation from the mainstream. Although, as an issue, the segregation/integration debate was a particularly sterile one, its important outcome was the realisation that integration and segregation were not mutually exclusive and that most educational situations carried elements of both. During the 1970's there would be fundamental changes evident in the education of the disabled child based on the renegotiation of boundaries between regular and special education.

In Australia a corresponding concern about the optimum educational environment of the disabled child found expression in the establishment of the Standing Committee on Health and Welfare by the Senate of the Commonwealth Parliament (1970). The brief extended to this committee was to report back to the Senate on the problems of and the assistance provided to mentally and physically handicapped persons in Australia. After an examination of the evidence submitted by over 46 voluntary organisations as well as government agencies concerned with the health, education and welfare of the disabled, the Senate Standing Committee (Wedgewood, 1971) recommended that the Commonwealth Government should become involved with:

(1) the training of teachers to meet the needs of handicapped children.

(2) the pre-school, school and vocational needs of disabled students.

In respect of the first recommendation, the Senate Standing Committee suggested that the Australian Universities Commission be encouraged to establish at least one university department of Special Education in each state, thus bestowing official status on this Cinderella of disciplines. By its second recommendation, the report facilitated the normalization process for handicapped students by providing the theoretical framework for additional specialized intervention at each critical period of their education.

The augmented role of the Commonwealth in the provision of specialised educational services was foreshadowed by the appointment in 1972 of the Interim Committee for the Australian Schools Commission, pending the establishment of the Schools Commission. This Committee was significantly influenced by the Wedgewood Report as well as by others relating to Education, Science and Arts (Davidson Report, 1972) and to Teacher Education (Cohen Report, 1973). As a result it recommended that the Minister should request the Australian Universities Commission and the Australian Commission on Advanced Education to investigate the provision for the training of teachers of handicapped children at tertiary institutions and to make financial recommendations to ensure its adequacy (Universities Commission, 6th Report, 1975). Furthermore, the Commissions advised that special grants be made to one university in each state to establish clinical, diagnostic teaching and research facilities to benefit teacher training programs and also increase the number of students undergoing such programs (Andrews, 1983). The government accepted the recommendations of the Interim Committee and appropriate legislation was enacted during 1974.

Apart from its concern with teacher education for the disabled, the Interim Committee was also well aware of the movement towards integration of handicapped individuals. It is important to note that in its report brought down in May 1973, concern for the education of handicapped children centred mainly on the financial needs of special schools and special classes. However, the Commission, in its reference to funding for its Special Education Program for 1976, also anticipated that, increasingly, recurrent grants would be used to support arrangements enabling a greater number of handicapped children to be integrated into regular schools. Indeed the report of the House of Representatives Select Committee on Specific Learning Difficulties (Mathews, 1976) concluded that educational policy should, in future, emphasize the importance of the school and the teacher in meeting special needs in the classroom, rather than emphasize special placement for those children classified as learning disabled.

INTEGRATION IN THE EIGHTIES

Thus, within one century in most developed countries, exceptional children have emerged from oblivion into the forefront of educational planning. Integration, normalisation and decategorisation of handicap have become the cornerstones of special education policy and have produced significant structural changes in service delivery. Whilst the educational needs of atypical children have become enshrined in legislation both in the U.S.A. (the Education of All Handicapped Children Act, PL 94-142, 1975) and in England (Education Act, 1981), a growing awareness of the needs of these children is evident in Australia by the expansion and reform of its Special Education Advisory Group by the Schools Commission in 1977. The National Survey carried out by the Schonell Educational Research Centre (Andrews et al., 1979) in response to the Special Advisory Committee's recommendation to the Schools Commission, was the first to adequately describe special education provisions in Australia and to point the way to improved services for handicapped children.

As part of its review of Special Education in Australia, the Schonell group also examined legislation and found a number of areas which were not only unclear or open to misrepresentation, but also discriminated against some groups of handicapped children. Only in Victoria, for example, was there legislative provision for children under school age (Watts, 1980), even though, throughout Australia, there was widespread support for the concept of early intervention for the disabled. (Since the 1984 amendment to the Tasmanian Education Act, passed in 1985, handicapped children below 6 years of age may be enrolled in a particular State school or Special Education facility). Furthermore, it had become evident that appropriate legislation, though a necessary prerequisite of special education implementation, was not a sufficient condition for its effectiveness. This distinction was well illustrated by Gerber (1984), in a critical analysis of the 6th Annual Report to Congress on PL94-142 (Education of All Handicapped Children Act) in the U.S.A., in which he maintained that reported substantive improvements in local special education services since the Bill's passage related more to mandated procedures (i.e. classification of students for special education services) than to educational opportunities for handicapped students in the classroom. Thus he argued that the major focus of future evaluations should be on the availability and deployment of the resources necessary for students perceived as difficult to teach rather than on the effectiveness of labelling procedures involved in the allocation of the funds to 'at risk' groups. Happily, there is growing evidence that in Australia as well as overseas, integration research has been moving from 'classification' issues to ones involved with the resource needs of the disabled child within his regular school (Bochner, this volume; Center & Ward, 1984; Center, Ward, Parmenter & Nash, 1985; Center & Ward, in press; Hudson & Clunies-Ross, 1984; Pieterse & Center, 1984).

It is also apparent, both at a Federal and a State level, that there is increasing awareness of new directions in the implementation of integration policy. In the Federal Commonwealth Report of the Handicapped Programs Review (Grimes, 1985), the advisory council recommended the 'provision of funds to enable disabled children to gain access to mainstream schools by upgrading physical accessibility and providing notetakers, support teachers, therapists and other staff and by developing alternative methods of teaching and assessment.' In N.S.W., additional resources earmarked for integration are largely being channelled into the provision of trained personnel to assist principals, teachers and parents with the education of disabled children in regular schools. Furthermore, a Tasmanian review concerned with the Integration of Special Children into Ordinary Schools (1983) highlighted the fact that, for a number of disabled children in regular schools, the matter of additional support represented an ongoing need. In addition, a Victorian Report of the Ministerial Review of Educational Services for the Disabled (Collins, 1984), in its specific integration recommendation, stated that all schools be encouraged to conduct an Integration Implementation Program by the end of 1985, and that appropriate assistance be made available for this. In accepting the Report, the Victorian Minister affirmed the current status of integration in the Australian community when he stated: 'In improving access to regular schooling for children with disabilities, the quality of education for all children should be enhanced.' (Letter from Minister when accepting Report).

CURRENT ISSUES IN INTEGRATION

Although the principle of integration appears to have been adopted throughout Australia as the preferred educational practice, there are still a number of issues to be resolved regarding its implementation, in terms of both the *enrolment* and the *maintenance* of disabled children in regular schools.

The Commonwealth Report of the Working Party on Special Education (Andrews, 1985) stated that special educational policy should be a response to the child's education needs irrespective of the setting in which learning occurs. Encouraging as this statement may be, the whole question of the disabled child's most appropriate learning environment ***at the point of school entry*** still remains somewhat problematic. Although, for all children with impairment, placement in a regular school represents a less restrictive educational option, such a setting may not provide the most appropriate educational resources in all cases. This is particularly true in any period of financial constraint, since overseas statistics indicate that ***effective*** special education services in regular elementary education are more costly, across all categories of handicap, than those provided in a specialized setting (Ashby & Taylor, 1984).

As a result it would appear that some guidelines or index need to be established by which a decision can be reached regarding an individual child's optimal educational placement. Items on such an index might include the extent of a child's resource needs, the level of special education services currently provided by local regular schools and district special school, the child's own adaptive characteristics and the parents' wishes. For example, if special education services can be organised on a graduated scale from 1-8 (See Table 1), then an appropriate assessment committee could estimate that, at the point of enrolment, a particular disabled child needed services commensurate with those defined in level 5.

Table 1 A model for delivery of Special Education services.

Level	Services
1.	special education services provided by the class teacher **without additional resources**
2.	special education services provided by the class teacher **with access to specialized instructional materials and equipment**
3.	special education services provided by the class teacher with **additional information and advice from specialist consultants and counsellors.**
4.	special education services provided by the class teacher **with additional support, including reduced class size, executive relief, clerical help, an aide.**
5.	special education services provided by a full- or part-time specially-trained teacher (sometimes itinerant) who either **provides support to teacher or withdraws on a sessional basis.**
6.	**special class placement** on a full or part time basis.
7.	**combination of regular and special school**, but receives no academic instruction in a regular class.
8.	**special school**

However, if none of the local schools provided special education services beyond those defined in levels 1-3, the committee, on which the parent should also be represented, might well consider that the disparity between need and provision within an integrated setting was too extensive to circumvent under current financial restrictions. In such a case, placement in a special school might present the more appropriate educational alternative if it provided the necessary resources to match the child's current needs. Alternatively, for another student, a smaller discrepancy between available services and current need might

be totally removed by the deployment of additional special services (e.g. a resource or itinerant teacher) to the local school. This approach recognizes that for some children, special schooling must remain a preferred educational option at the point of school entry, whilst at the same time, it refrains from rigidly fitting a disabled child to the existing service provisions operating in his local school district.

Another problem area of integration is the one concerned with the *maintenance* in regular schools of those disabled children who are already a part of the system. These would include a relatively small number of students with a specific disability which actively impedes their academic and social development and a much larger group who require re-teaching and resource assistance across all basic skill areas. The Report of the Working Party on Special Education (Andrews, 1985) has stated that all pupils in regular schools should be seen as students of those schools which should then be constrained to accept responsibility for their learning difficulties. However, it must be realised that in N.S.W., at least, less than 30% of regular teachers have undertaken any special education training and the provision of relevant in-service courses has been minimal. Furthermore, only 50% of N.S.W. schools are provided with resource teachers, almost half of whom have received no systematic special education training (Center & Ward, in press). It is unfortunately also true that in government special schools, over 50% of teachers have not undertaken special education courses. Thus, if special needs students are to be effectively maintained in both regular and special settings, the proportion of regular, resource and special school teachers with specific training in special education must be dramatically increased.

In conclusion, this chapter has attempted to present an historical overview of special education from its origins within the residential school movement to its present high profile position within most regular educational systems. The acceleration of appropriate service delivery to disabled children during the eighties has been outlined as well as those difficulties that almost always beset the actual implementation of a new educational philosophy. There is no doubt that educational authorities, both overseas and locally, have opted for a process of increased participation and increased maintenance of disabled children within the regular school system. Indeed the Report of the Special Education Working Party on Commonwealth policy and directions in Special Education (Andrews, 1985) proposed to include integration funds in the total education allocation to individual States to obviate limitations in previous funding arrangements and to accommodate diversity in State policies.

Although the funding procedures for the integration process remain beyond the scope of this book, the strategies which can assist the child, parent, teacher and regular school to cope more effectively with integration form the bulk of this present text and will be discussed in the subsequent chapters. It could well be that, as we look towards the future, special education as a classification of service delivery will become an anachronism and simply be subsumed into the quality education we demand for all children.

Chapter 3

EARLY INTERVENTION: AN OVERVIEW

Yola Center

DEFINITION

Early intervention may be defined as the organised efforts to enhance the development of infants and young children who are at risk of delay either through organic impairment or social disadvantage. By providing appropriate home and/or community based programs from the time of diagnosis or referral, early intervention may be able to minimise the handicapping effect of a child's disability and consequently reduce the difficulties that will undoubtedly be encountered in both social and educational settings. Thus early intervention may be viewed as the first facilitative strategy along a continuum of services required by the high risk child and his family to maximise both the quality and the quantity of his learning experiences throughout infancy, childhood, adolescence and adulthood. Although the focus of this book is the special needs child for whom integration into regular school is a potential outcome of early intervention, the delivery of appropriate early services aims to provide each child, irrespective of the severity of his handicap, with the skills needed to function with maximal independence in as near to a normal community setting as possible (Hayden, McGinnes & Dimitriev, 1976).

HISTORICAL BACKGROUND

Although the association between the quality of a young child's early learning experiences and his subsequent cognitive and affective development had been recognised by such educational pioneers as Comenius, Rousseau, Seguin and Montessori, much of the impetus for the recent emphasis on preschool education has derived from the theory and practice of the mid 20th century. The classic investigation conducted by Skeels and Dye (1939) with retarded children in a grossly deprived institutional setting demonstrated that early stimulation provided by consistent, loving caregivers could significantly improve the intellectual performance of these children and maintain it over time. Another probable precursor of current early intervention programs was the controlled study of early intervention with retarded preschoolers undertaken by Kirk (1958). The results indicated not only that such intervention accelerated the children's rate of mental development, but also that progress was significantly impeded by lack of stimulation. Concurrently with this experimental evidence the theoretical rationale for early intervention was provided by Piaget's (1952) interactive concept of cognition which stressed the need of the developing organism to be positively challenged by the environment. Furthermore, McVicker Hunt's (1961) attack on

the notion of fixed intelligence and Bloom's (1964) emphasis on rapid cognitive development during the early years had a profound effect on the adoption of the principle of early intervention for high risk pre-school children.

Early Intervention for the Socially Disadvantaged

The positive impact of early intervention for the intellectually impaired coupled with the burgeoning movement to equalise opportunities for the under-privileged were two precipitating factors in the provision of compensatory early education for the socially disadvantaged. In the U.S.A., during the 1960's, there had been mounting concern over the cycle of poverty experienced by children from low income families and the inability of the regular school system to meet the needs of these children from diverse ethnic and minority groups. A promising combination of ample federal funding and a conviction, based on success with the retarded, that environmental enrichment would eliminate the poverty cycle and enhance the relevance of regular education, instilled enthusiasm in the early planners. Consequently, in 1965, Project Head Start was launched to provide compensatory pre-school education for children from low socio-economic status families, and became the first major modern revival in pre-school education. Although the much publicized Westinghouse evaluation (Cicirelli, 1969) was not generally supportive of the overall impact of the program in terms of sustained IQ gains, three important outcomes of the practice of early intervention were derived from the evaluation of the diverse Head-Start programs (Bronfenbrenner, 1975; Horowitz & Paden, 1973).

1. programs which offered an organized, goal-oriented, structured approach were most effective.
2. positive effects tended to dissipate after intervention terminated, with the trend becoming more pronounced the more extended the follow-up.
3. involvement of families in programs appeared to be associated with more enduring gains.

Thus it was evident that programs which anticipated the future school needs of young children and managed to involve their parents with the educative process were the most likely correlates of successful integration into regular school.

Early Intervention for the Organically and Biologically Impaired

Whilst the major thrust of early compensatory programs was directed towards socially disadvantaged children, there was increasing recognition that children at risk of developmental delay through organic or biological impairment would also profit significantly from the earliest possible intervention. Indeed legislation enacted in 1972 required Head Start programs to include handicapped children to the extent of at least 10% of their enrolment. Furthermore, many early intervention projects throughout the seventies focussed on children with a broad spectrum of specific handicapping conditions (Watts et al., 1981). Exemplary programs were devised for the blind (Fraiberg, Smith & Adelson, 1969; Fraiberg, 1971), the hearing impaired (Horton, 1976), the cerebral palsied and multihandicapped (Barrera et al, 1976; Haynes, 1976), children with Down's Syndrome (Hayden & Dimitriev, 1975; Rynders & Horrobin, 1975), and the severely and profoundly handicapped (Allen, 1976; Haring & Cohen, 1975; Jordan, Hayden, Karnes & Wood, 1977). Whilst it was clear that organically impaired children's development was primarily affected by their specific disability requiring appropriate interdisciplinary input (Allen, 1978) they also ten-

ded to be environmentally deprived because of their limited interactive ability and, at times, their inappropriate handling at home. Thus the key to successful intervention programs both per se and as precursors to regular schooling for organically damaged children was appropriate structured programming and the participation of parents in educational decision making (Sontag, 1975).

EVALUATION OF EARLY INTERVENTION PROGRAMS

1. The Socially Disadvantaged

There is no doubt that the diversity of early intervention programs, in terms of setting, curriculum and clientele makes evaluation procedures extremely complex. Indeed, it is hardly surprising that the original Head Start evaluation (Cicirelli, 1969) which focussed solely on the target child and his IQ gains did cast serious doubts upon the impact of the program for socially disadvantaged children. The subsequent pessimism engendered by this evaluation regarding the effectiveness of early intervention was tempered only by the differential effects found amongst the different program inputs and outcomes referred to in an earlier section. It now seems clear, however, that the original focus of early intervention evaluation had been unduly restrictive. Criticism has been levelled at the Westinghouse evaluation not only at a statistical level (Campbell & Erlebacher, 1970) but also on the basis that evaluations of early intervention programs should transcend the child's IQ gains. Although intellectual and school achievement data are characteristics that are the easiest and least confusing to measure, there are other program objectives which are broader, deeper and more humane than the restricted aspect of the child's performance measured by standardized tests (Bronfenbrenner, 1975). Furthermore, the traditional experimental methodology may not be the most appropriate tool for the evaluation of early intervention programs for young handicapped children. Berry (1981) advocated the use of ethological, ethnographic and ecological procedures, which are concerned with children in their natural environment, to help determine why, when and how to develop and implement early education programs for individual handicapped children and their families.

Consequently, those strongly committed to early childhood intervention began to search for alternative means of evaluating national programs like Head Start (Zigler & Berman, 1983). In a unique study, Gray & Klaus (1970) focussed on the immediate families of an intervention group and reported IQ gains for the target children's younger siblings. The researchers hypothesized that the program's emphasis on maternal interactions with the target child generalised to other children in the family. As they noted, their study has significant implications for the possible enhancement of children's development through manipulation of the family environment. A later study (Abt Associates, 1978) found that 95% of the parents of Head Start graduates endorsed the program since it provided opportunities for socialisation with other adults. Early intervention also seemed to directly affect parental attitudes towards their children's education by encouraging greater involvement with the child's studies at home (O'Keefe, 1979) and with his teachers at school conferences (Abt Associates, 1978). Similar unprogrammed benefits have also been reported in Australia (Braithwaite, 1983). Thus a positive outcome of early intervention programs for the socially disadvantaged, ignored by the measurement of conventional academic gain scores, was a genuine improvement in parents' perceptions of the influence they had over their children's educational future.

Furthermore, in terms of integration into regular schools, longitudinal data on disadvantaged children who had participated in early intervention programs indicated that these children were more committed to schooling and were performing better academically than

children who did not attend preschool (Schweinhart & Weikart, 1980). Apart from higher scores on reading, arithmetic and language achievement at all grade levels, they showed a 50% reduction in the need for special education services through to primary and high school as well as less delinquent behaviour outside of school. In addition, recent longitudinal evaluations have also revealed long-term differential effects between early intervention programs. Sprigle and Schaefer, 1985, reported that a structured cognitive-developmental program with emphasis on home/school partnership resulted in significantly improved academic performance and retention in grade to the end of primary school when compared with the outcomes of a less structured form of early intervention.

However, even when the focus of early intervention evaluation is the target child, several researchers (Zigler, 1973; Zigler & Trickett, 1978; Ramey, MacPhee & Yeates, 1982), believe evaluations should exceed simple IQ scores and achievement measures. There is consistent evidence that a focus only on preacademic skills in an early intervention program may overlook some of the other skills that a child is expected to display in a regular school kindergarten class (Vincent et al., 1980). These prerequisite survival or social skills include attending, volunteering, compliance and direction following. Without their acquisition, a child will not be able to function effectively in the formalised large group setting of a typical kindergarten class and may become a behaviour problem despite successful performance on a preacademic screening test. Zigler, in fact, has argued that social competence, a measure related but not equivalent to IQ, is the most appropriate criterion for evaluating intervention programs. Although there is no universally accepted definition of social competence, Zigler and Trickett (1978) identified four major classes of variables that should be utilized in any appropriate assessment of early childhood intervention efforts, which are:

1. physical health.
2. formal cognition, as assessed by standard IQ tests or Piagetian measures of cognitive functioning.
3. achievement, which could be assessed on any of a variety of standardised instruments.
4. measures of motivational and emotional variables which could include self-esteem, responsiveness to adults and attitudes towards school.

In combination, such indices of social competence can provide a meaningful assessment of the range of intervention effects on all areas of children's development (Zigler & Berman, 1983). The authors have argued that in our zeal to apply the most exact and scientific instruments to the search for long-term specific cognitive intervention effects, we may have lost sight of the more basic improvement in the quality of life that has been achieved by the delivery of early intervention.

2. The Organically Impaired

Although the research evidence on the efficacy of early intervention programs for organically/biologically impaired children is correspondingly meagre, it nevertheless tends to be more positive. This effect is no doubt associated with the fact that programs for these children tend to be organised in discrete disability groups and measures of specific outcomes for each category of handicap may be more amenable to short term gains. For example, Northcott (1971) reported that early intervention for deaf preschoolers prevented the development of maladaptive behaviours which normally contribute to the poor social integration of deaf children in regular schools. Bruininks & Kennedy (1974) demonstrated high levels of social acceptability at elementary school level for hearing-impaired children who had experienced appropriate early treatment, structured pre-school education and

whose parents had undergone early counselling procedures. Furthermore, Horton (1976) found significant differences on measures of language complexity and achievement tests between children who had entered a program for severely hearing impaired children before the age of three and those who had commenced after their third birthday. Those children who had received early intervention and stimulation were similar to normal hearing peers on both the language and achievement measures. Nix (1976), when summarising the research pertinent to mainstreaming of the hearing impaired, concluded that one of the parameters for a successful integration placement was early detection of the hearing impairment together with enrolment in a family-oriented special education program. A local study (Bochner, Price, Salamon & Brownell, 1981) further reinforced the use of early intervention for *language delayed children* and their parents by showing that a teaching strategy based on a transactional approach to language acquisition administered by parents is effective in improving early language skills.

There are also a number of research studies indicating that services aimed at reducing the debilitating effect of *neurological handicap* should be commenced from the time of diagnosis. Following an early intervention project conducted at United Cerebral Palsy of Queens, U.S.A., Weider and Hicks (1970) reported significant gains in physical, social and intellectual growth for a group of neurologically-impaired infants aged from 9-44 months. The authors, however, failed to explain the lack of progress in another group with lower entry skills. Hochleiter (1977) described a study in which 749 infants were examined during an 8 year period. Infants with delays in neural development who were not treated early in life suffered moderate to severe motor impairment in 64% of cases. However, when neurodevelopmental treatment was initiated early, 87% of the children were reported to be pursuing a normal life-style.

Although it is not ethically possible to set up an experimental design to test the efficacy of early therapeutic treatment, an ex post facto research project conducted at the Spastic Centre (Center & Reye, 1974) appears to support its use. Six pairs of twins were involved in the study with one normal twin and one having mild neurological signs which had been treated from the age of 6 months or earlier. At the time of testing, the twins ranged in age from 18 months to 56 months. Results indicated that there was no evidence of abnormal neurological signs in any of the six previously affected twins nor any significant difference between the pairs of twins on standard cognitive measures. The authors hypothesized that the therapeutic stimulation from the time of diagnosis not only improved physical function but also enhanced parental and environmental interaction. Although some researchers disagree over the value of parental participation in early therapeutic intervention programs for young cerebral palsied children (Parette & Hourcade, 1985) the research evidence quoted by them is problematic and does not appear to support their conclusions. Despite their misgivings however, these authors still concluded that family participation in therapy would continue since budgetary constraints generally would tend to restrict other programmatic options.

The past two decades have also witnessed an unprecedented upsurge of interest in early childhood programs aimed at children exhibiting *developmental delay*. The results of a number of significant research studies appear to suggest that exemplary early intervention can positively modify the physical, cognitive, linguistic and behavioural characteristics of intellectually disabled children by the age of school entry (Rynders & Horrobin, 1975; Hayden, Morris & Bailey, 1977). Local research evidence in both N.S.W. and Victoria from early intervention projects with Down's Syndrome children appear to support the efficacy of structured early programming reported in American studies with a young intellectually handicapped population. In N.S.W., the Down's Syndrome Program was instituted at Macquarie University in 1977, with the express aim of preparing its children for integration into

regular schools. The program monitored progress annually from enrolment until school entry and found that even after 12 months of structured intervention, the original intake children were significantly superior to a control group of Down's Syndrome children on measures of gross and fine motor, language and personal-social skills (Pieterse, 1978). By 1984, 12 graduates of the program had been integrated into regular classes in their local schools up to 6th grade level. In a routine follow-up study in the schools almost all the children demonstrated appropriate levels of social acceptability, although regular teachers were continually stressing the need for resource help for the children, particularly in the academic area of mathematics (Pieterse & Center, 1984). This early intervention program has also been replicated in Hong Kong with correspondingly positive results (Pieterse, 1986, personal communication).

In Victoria a similar program operating at the EPIC Centre at the Phillip Institute of Technology also found markedly accelerated rates of development for its Down's Syndrome children in language, cognitive, fine-motor, gross-motor, social and self-care skills (Clunies-Ross, 1979, 1981). In contrast, the overall rate of development of children prior to entering the program had been found to decline progressively. While analysis of rate of development by age has shown similarly accelerated rates across differing ages of entry, younger children are clearly advantaged by the shorter time required for them to approximate normal levels of skill development. When a follow-up of 15 EPIC graduates was undertaken (Hudson & Clunies-Ross, 1984) results were found to parallel those already described in N.S.W. Their data indicated that most children had adjusted well to the classroom setting and were also well accepted by their peers, although academically, their performance was more variable than their social acceptability. However, both teachers and parents exhibited positive attitudes towards the integration of the target children in regular classes. These local initiatives have underscored the way in which appropriate early intervention provided to children with developmental delay has permitted Down's Syndrome children to be educated in an integrated environment, an option which had previously been denied to them by virtue of their diagnosis.

FUTURE DIRECTIONS FOR EARLY INTERVENTION

When anticipating the future direction of early intervention programs for socially disadvantaged and developmentally delayed children a number of benchmark features appear to have emerged from the evaluation of both current programs and their theoretical underpinnings. In the first instance, perhaps, the emphasis will probably move from the *critical period* concept for institution of intervention, to focus on the *continuity* of provision. Zigler and Berman (1983) suggested that the most successful intervention should comprise a series of dovetailed programs, independently available as the need arises, with each appropriate for a particular state of development—prenatal, infancy, toddlerhood, preschool, pre-adolescence, adolescence and adulthood. As Seitz (1981) has noted, the most instructive model for intervention efforts is the secure family unit which supports its young not only at critical developmental stages but continuously throughout their lives. This would approximate the view expounded by Vincent et al (1980) that the major goal of intervention services is to teach handicapped children the skills necessary to function not only in current situations but also, most importantly, in the future environments that are available to all normal children.

A further feature of effective early intervention programs relates both to their *content* and *theoretical orientation.* A number of evaluation studies (Stedman, 1982) indicated that relatively larger enduring gains in children's achievements were associated with programs

which had specific developmentally-appropriate objectives taught in a systematic way rather than those which aimed mostly at general enrichment. Furthermore, progress was also significantly related to those programs whose objectives generalised to the child's environment rather than those which targetted specific kinds of activities in a laboratory setting. There has thus been a corresponding shift from behaviourist or stimulus-response theories of learning in preschool education to a more complex view of learning derived from a cognitive learning perspective (Anastasiow, 1978; Bricker, Seibert & Casuso, 1980; Guralnick, 1975). Consequently, it may be predicted that the theoretical framework of early intervention programs will, in the future, be more oriented towards a cognitive model of learning with behaviourism being used as the technology of program construction and implementation. Concurrently, the simplistic IQ measure as a screening device will tend to be replaced by a battery of instruments which will assess the social-physical environment as well as the child's developmental level in the intervention domains of gross and fine motor, communication-language, cognitive and social self-help. These curriculum-based assessment instruments with their finely sequenced developmental levels, together with standardized criterion-referenced measures such as the Uniform Performance Assessment System (White, Edgar & Haring, 1978) will also be more effective in evaluating the outcomes of an intervention program.

In a comparison of the relative merits of *centre-based* pre-school type programs focussing on the child, with the far less expensive and intensive *family-support* approach, Zigler and Berman (1983) opted decisively in favour of the latter alternative for socio-economically deprived children. They argued that if equal benefits from the less costly approach were indicated and these benefits extended to the family on a long-term basis, then the family-support program had a clear advantage. They substantiated their viewpoint by contrasting the intensive approach of the Abecedarian Project (Ramey et al., 1976), where child-rearing is largely the responsibility of program staff, with the family support approach represented by the Yale Project (Provence, Naylor & Patterson, 1977; Rescorla, Provence & Naylor, 1982). Both programs elicited long-term gains on measures of grade level performance, but the Yale Project families also indicated improvement in quality of family life which was not the primary focus of the Abecedarian Project.

It is, perhaps, inadvisable to generalise these conclusions based largely on socially-deprived children to programs specifically aimed at organically damaged children. Indeed, in Australia, the distinction between home and centre-based programs has become rather blurred, since the focus of most intervention programs for organically damaged children is helping parents facilitate their child's development. Whilst recognizing that family support is a necessary focus of early intervention programs, it may nevertheless not be a sufficient one and will need to be supplemented by a centre-based approach. Indeed, in a recent metanalytic study of the efficacy of early intervention programs for handicapped pre-schoolers, (Casto & Mastropieri, 1986), little support was found for commonly held beliefs about the value of parental participation. It must be stressed however, that the only outcomes which the authors examined were related to children's cognitive abilities rather than affective competencies or peer and family relationships. The final mix, will, no doubt, be dependent on the age of the child, the severity of the handicap as well as the capability and willingness of parents to undertake the dual role of maintaining a family unit and teaching their handicapped child. Whilst an amelioration of family life style may be the major element in giving socially deprived children a 'headstart', children with organic damage also need the combined skills of a transdisciplinary team to plan individual objectives for a child for whom simple environmental interaction is insufficient. It is therefore suggested that a flexible approach towards program orientation be maintained, so that acceptance of 'therapist/teacher' role for parents does not become the price of admission of a han-

dicapped child into a program (Watts et al., 1981). Professionals should not let their enthusiasm for parental involvement blind them to the reality of individual differences within each 'high risk' family's life.

Other directions are also evident in the intervention programs aimed specifically at the organically handicapped child. It is clear that the historical emphasis on *homogeneity* with respect to the delivery of early intervention services has been slowly changing. Grouping children on the basis of homogeneity of handicap was undoubtedly fostered both by parent groups and by specific research interests (Apelt, 1981). By contrast, the emerging orientation to *heterogeneity* has developed through an emphasis on the children and the dimensions of their problems, rather than upon the disability per se. The bringing together of different disability groups, provided the necessary transdisciplinary staff is available, does permit the establishment of small centres closer to children's homes rather than the more geographically-remote large specialist institution. Although it is neither possible nor desirable to avoid the categorisation of handicapped children, there are obvious advantages in replacing discrete categories of handicap with a developmental classification which has significantly more educational relevance. The effectiveness and replicability of an early intervention program designed by Bricker and Sheehan (1981) with a heterogeneous group of children with intellectual, hearing, visual and motor disabilities bears striking testimony to the success of this orientation.

We have thus come a long way in improving appropriate early intervention to special needs children even though we are yet far from an ideal system of early service delivery. At this time, in Australia, early intervention is not available to all as funding for programs is not permanently secure, there is no systematic dissemination of curricular or staff development methods to nascent centres, nor is responsibility for early intervention and regular education vested in the same agency. However, the growing recognition of the importance of early intervention for socially disadvantaged and organically impaired children as preparatory to successful integration has resulted very recently in a number of new developments, which augur favourably for its effective implementation. In N.S.W., for example, apart from a number of privately and publicly funded exemplary programs in metropolitan areas, a package program similar to the U.S. Portage Program (Shearer & Shearer, 1972) but with incorporated video-taped teaching procedures has just been completed (Pieterse, Treloar, Cairns & Brar, in preparation) which will bring to isolated parents the early services previously denied them and their children. Of even greater significance is the recent inclusion of early intervention services within the ambit of some State Departments of Education, such as Tasmania, so that coordination between pre-school and school services, as has existed in Queensland since 1979, can now be implemented in other States. Furthermore, at a national level, the recognition by the Commonwealth Schools Commission of the need to provide educational services to disabled children below school age has resulted in the release of Commission funds for this specific purpose across the States and Territories. These initiatives notwithstanding, it is imperative that as these children attain school age, the gains towards normalcy achieved through the process of early intervention are not lost through lack of provision of appropriate support services during the subsequent vital period of schooling. Early intervention may indeed be an unfortunate semantic misnomer if it implies simplistically that a time-limited educational intervention will result in a relatively permanent behaviour change (Strain, 1984). Mindful of this as a future challenge, and in view of both past achievements and present endeavours, we may yet reach our goal of the provision of appropriate, continuous intervention services to all children at risk regardless of the origin of their disability or disadvantage.

Chapter 4

PRESCHOOL INTEGRATION AND THE SOCIAL SKILL DEVELOPMENT OF HANDICAPPED AND NON-HANDICAPPED CHILDREN

Moira Pieterse
Sue Cairns

INTRODUCTION

As noted in Center (this volume), early intervention for children with disabilities aims to optimize their development, in order to facilitate normalization of their life experiences. For children under school age, the process of normalization includes access to the generic educational services that the community provides for young children, such as play groups, preschools and kindergartens. However, for many young disabled children, such access is only likely to be effective if they can be helped, usually through appropriate early intervention services, to acquire skills in a number of key areas of development. This paper is concerned with the social behaviour of disabled children, which represents one of the critical skills needed for successful integration at the preschool level.

While the origins of early intervention lay in the work of educational pioneers like Comenius, Rousseau, Seguin and Montessori, the more recent stimulus came from the compensatory preschool programs, funded in the U.S.A. under Headstart, for inner-urban, disadvantaged black children. Teaching materials designed for use in these compensatory programmes (e.g. Distar Language; Engelmann, Osborn & Engelmann, 1969 and the Peabody Language Kits; Dunn & Smith, 1965) tended to focus on the development of highly specific cognitive or school type skills, particularly receptive and expressive language, that were considered to be prerequisites for reading, writing and number. However, there were also a number of other skill areas related to progress at school which caused relatively few problems for socially disadvantaged children, but needed to be included in programs for children with disabilities. Such skills included, for example, fine and gross motor skills, personal or self help skills and, more particularly, the social skills that were required for successful integration into both preschool and regular primary school. Programs developed specifically for children with disabilities generally included all these skill areas in their teaching objectives (e.g. the Portage Program: Bluma, Shearer, Frohman & Hillard, 1976; the Macquarie Program for Developmentally Delayed Children: Pieterse, 1981; and the Uniform Performance Assessment System: Haring, White, Edgar, Affleck & Hayden, 1981).

The acquisition of social skills frequently presents a particular problem for young children who have disabilities. From birth, they often demonstrate relatively low (or deviant) levels of responsiveness to adults (Field, Goldberg, Stern & Sostek, 1980) and at an age when most

children have learned to share, take turn and join in cooperative games with their peers, many of these are still only capable of isolated or, at best, parallel play (Guralnick, 1978). Social interaction and play provide important opportunities for young children to acquire and practise new skills, through imitation of others' actions and exploration of new materials, as well as by repetition and practice of recently acquired skills (Piaget, 1952). So an inability to participate with other children and adults in successful social interactive and play activities is a serious impediment in the development of disabled children, contributing to increasing delay in their acquisition of new skills and creating barriers to later successful integration with their peers into regular educational settings such as preschool and school.

This paper is concerned with the social development of a group of very young Down's Syndrome children (Pieterse, Cairns, Treloar & Redmond, 1979). Initially, some recent research on the emergence of peer interaction skills in young children is reviewed. This includes the place of toys in such exchanges, and the impact of factors such as age, familiarity and level of handicap on the social interaction of young children with and without disabilities. Issues related to the integration of disabled children into regular preschools are then considered and three models of integration are described. Finally, a study on the social interaction of Down's Syndrome children in integrated preschool and regular school settings is reported and conclusions are drawn regarding the effect of early intervention programs on the social skill development of young disabled children.

THE EMERGENCE OF PEER INTERACTION

Initially, infants' most significant social interaction takes place with their primary caregivers, usually their mother. Subsequently, other adults, particularly fathers, begin to assume an increasingly important role and over time, infants learn to interact with a variety of other people in the immediate family and wider social settings. They begin to interact with their peers from as early as six months of age and by nine months, will direct their behaviour more often to a peer than to their mothers, if both are present, though the overall rate of peer interaction is usually low and many initiatives are not reciprocated. During the second year, the number and type of interactions with peers increase and become more complex. Initially, such contacts are often centred on objects, but gradually infants learn to interact with other infants, taking turns in initiating such contacts. By the end of the second year, most children have become verbal and their interactions with peers begin to show a clearly communicative function. However, the level and rate of occurrence of these exchanges appear to be influenced by a number of factors, such as the toys or materials present, the age and relative familiarity of the peers, and the amount of previous experience the child has had in interaction with other children (Eckerman & Whatley, 1977; Finkelstein, Dent, Gallagher & Ramey, 1978; Lewis, Young, Brooks & Michalson, 1975; Mueller & Brenner, 1977; Vandell & Wilson, 1982).

Toys: From the second year, toddlers will readily approach and attempt to touch toys manipulated by other children, possibly as a means of identifying a shared interest, in much the same way as preschool children sometimes use objects to begin a conversation with a strange adult (Bates, 1976). At this stage, the child is likely to play with the toy in imitation of the other child. This strategy seems to free the child from trying to produce novel social responses and lengthens the duration of the interaction. Imitation of the other child's actions continues until the child is able to devise more appropriate complementary acts for use in games with peers (Eckerman & Stein, 1982).

Not all exchanges involving toys are positive, particularly among younger children, though younger peers usually do not respond to conflicts (Holmberg, 1980; Odom, 1983). Some

toys are more likely to facilitate successful social interaction than others (e.g. play house equipment rather than trains or sand), just as some play settings appear to be more conducive to social exchanges than others (e.g. social behaviour is more likely to occur when only a few toys are available) (Fredericks et al. 1978; Krasnor & Pepler, 1980; Novak, Olley & Kearney, 1980). However, learning to cooperate with a peer in a game involving a toy or other material can provide a useful vehicle for acquiring more advanced social interaction skills.

Age, familiarity and level of handicap: From as young as nine months, the rate of social interaction and the level of play increases with the relative familiarity of the children (Becker, 1977; Doyle, Connelly & Rivest, 1980; Kagan, Kearsley & Zelazo, 1975; Lewis, et al, 1975; Vandell & Mueller, 1980). Apparently, as with familiar adults, increased familiarity between children results in their acquisition of a repertoire of play routines which, in turn, can be used in the development of friendships and cooperative activities with other children. Not unexpectedly, this effect is most evident among siblings, where the most advanced forms of social play are usually observed (Dunn & Kendrick, 1980; Mueller & Lucas, 1975; Ross & Goldman, 1976).

There is some evidence from studies of social play in families, that older siblings are more likely to produce behaviours that may either initiate, or alternatively, strain the interaction that occurs in a game, whereas younger siblings are more likely to act to maintain the exchange. A similar pattern probably occurs in the games played by mixed age groups, which, apparently, have a socializing effect on younger or less competent children. Several recent studies have sought to take advantage of the positive skills of younger children in mixed-age groups. These studies were influenced by the work of Suomi and Harlow (1972) who demonstrated that socially isolated infant monkeys manifesting high anxiety levels responded positively to advances from younger, normal monkeys, whereas contact with monkeys of the same age had no effect on their isolated status. Subsequently, Furman, Rahe and Hartup (1979) reported that withdrawn or isolated preschool children also responded more positively to the advances of younger, rather than same age playmates. Hartup (1980) noted that 'unique socialization potential resides in play with younger peers for children who are at risk in the development of social competence' (p.255).

The comment made by Hartup on the potential value of play with younger peers for children lacking social competencies is relevant to the subject of this report, which is concerned with the integration of disabled children with their peers in regular preschools. However, further research may need to be carried out to determine if the desired effect described by Hartup takes place when children with and without disabilities are grouped together, since recent studies suggests that, without adequate encouragement and support, spontaneous interactions between handicapped and non-handicapped preschoolers are not likely to occur at a great rate. This is especially true where children with widely differing problems and skills are integrated into the preschool setting, since there is usually a distinct preference by non-disabled children to interact with other children who exhibit similar levels of competency in their play (Devoney, Guralnick & Rubin, 1974; Feitelson, Weintraub & Michael, 1972). A number of studies have investigated techniques for increasing verbal, social and play interaction among children with and without disabilities in preschools. Methods shown to be successful include peer imitation training (Peck, Apolloni, Cook & Raver, 1978), peer modelling and approach (Strain, Shores & Timm, 1977) conversational and social skills training (Whitehall, Hersen & Bellack, 1979), vicarious reinforcement (Kazden, 1973, Bandura, 1971) and symbolic modelling (Ballard, 1980). However, the efficacy of these procedures appears to result primarily from the fact that they enable the disabled and non-disabled children to get to know each other more easily than without

such assistance. As noted earlier, the likelihood of positive social interaction occurring increases with familiarity.

Finally, there is evidence that a major factor affecting peer interaction is the amount of experience a child has had in interaction with other children. Studies with day care children suggest that experiences with peers from an early age may facilitate the development of effective social skills (Mueller & Brenner, 1977; Rubenstein & Howes, 1979). This effect is probably also true for children with disabilities (O'Connell, 1984) and adds weight to the argument in support of the integration of young disabled children with their peers at all levels of education, including play groups, and, at a later age, regular preschools.

INTEGRATION IN THE PRESCHOOL

Three models of preschool integration will be reviewed here. The first, a facilitating environment model, involves simply placing disabled children into regular preschools. The second, a direct intervention model, assumes the need for some manipulation of events for the successful integration of children with impairments in preschools, while the third model is based on the idea that children should be prepared for integration, through appropriate teaching programs, prior to (as well as concurrently with) their enrolment in regular education settings.

The initial move towards the enrolment of children with disabilities in regular preschools was justified on the basis of social equality rather than on specific psychological or even educational grounds (Stobart, 1986). This led to the assumption that merely placing disabled children in these facilitative settings would be beneficial, both to them and to their peers. It was argued that such placement would result in:

(a) increased social interaction between disabled and non-disabled children.
(b) increased acceptance of children with disabilities by their peers.
(c) modelling of the behaviour of their peers by the disabled children (Gresham, 1982).

This approach to preschool integration has been described as a *facilitating environment model.* It is based on the view that activities and materials within a preschool can be organized to encourage spontaneous interaction between disabled children and their peers, but no planned intervention should occur. There is some evidence to support this approach. For example, Burstein (1986) reported that in an integrated preschool the rate of interaction between handicapped and non-handicapped children was highest when the children were left to play without adult supervision.

Critics of the facilitating environment model, however, claim that simply placing children with disabilities in a setting with non-disabled children will have little effect unless measures are taken to provide direct programming. They maintain that special teaching strategies must be employed to increase interaction and social skills development. This second approach to intervention has been termed the *direct intervention model.* In this approach, disabled children are prompted and reinforced for interacting with their peers, while their peers are reinforced for modelling appropriate behaviour and interacting with the disabled children, following a planned schedule, at specified times and places. In comparison with the facilitating environment model, the direct intervention model calls for more specialised teacher training and might be preferred for more seriously disabled children. In fact, proponents of the direct intervention model argue that the traditional preschool is an unlikely place to encourage the development of social skills in disabled children without the provision of some direct programming. Yet evidence cited earlier indicates that even informal contact between children with and without disabilities can facilitate social interac-

tion. Clearly, if integration at the preschool level is to be attempted, it is important to determine which children are most likely to benefit and the conditions that will have the greatest impact.

Guralnick (1978), in an acclaimed review of preschool integration over the previous decade, notes that the degree of children's social separation in preschool tends to increase as a function of the severity of their disability (Guralnick, 1981). His conclusion, that further study is needed to identify what works, when and for whom, in the integration of disabled children at the preschool level, has been followed by research on two fronts: firstly, by studies which examined the degree of interaction which occurs spontaneously between disabled and non-disabled children when no changes are made to variables such as teacher initiated exchanges and play equipment layout, and secondly, identification of the direct approaches or strategies which effectively increase social interaction between the two groups.

In a review of recent research, O'Connell (1984) concluded that when children of varying degrees of ability are integrated, there is a gradual and spontaneous increase in social interaction with the result that the disabled children are not isolated or rejected. The contradiction between this finding and those of earlier studies may be related to the proportion of disabled and non-disabled children present in the preschool group. The early research projects were frequently conducted in so-called 'integrated preschool classrooms' in university research projects, with a high proportion of disabled to non-disabled children. Apparently, when the ratio of disabled to non-disabled children decreases, the degree of social interaction increases. Peterson and Cooper (1978) noted that there was some social interaction between moderately disabled and non-disabled children in a mixed setting, but when the disabled children were placed singly with a group of non-disabled children, isolated play dropped from 62% to 35% of time observed, while parallel play increased from 29% to 36% and the cooperative play from 9% to 29% of the time. This suggests that if a disabled child has some appropriate play skills and there are no other low-functioning children present, he or she will demonstrate more of the play skills modelled by peers, as seen in parallel and more genuine cooperative play. Overall, it appears that there is support for the claim of the facilitating environment model, that some degree of social interaction takes place spontaneously when disabled children, varying from severely to mildly impaired, are placed in regular preschool settings (O'Connell, 1984).

However, questions remain concerning the role that teachers should take to facilitate social interaction between children with disabilities and other children in the preschool. For example, although Guralnick (1978) noted that direct intervention increased specific interactive behaviours in university research preschools, some studies found that directive behaviour by teachers tended to hinder peer social interaction and increase the number of adult-child interactions. Others studies reported that teacher presence adversely affected play behaviour with passivity and idiosyncratic stereotyped behaviour increasing in the disabled child when the teacher entered the room (Novak et al, 1980).

Rather than employing the relatively intensive approaches suggested within the direct intervention model, Vaughn, Bos and Lund (1985) identify several management techniques for facilitating peer interaction in preschool as a means of improving the social development of disabled children. They suggest that the children should be placed with preschool teachers who have positive attitudes towards the handicapped (Brophy & Good, 1970; Center, this volume): this should lead to the provision of activities which will encourage positive attitudes towards the children with disabilities by the other children (Esposito & Peach, 1983). Classroom materials and equipment should be arranged to encourage cooperative activities that involve all the children (Johnson & Johnson, 1980; Shores Hes-

ter & Strain, 1976; Guralnick, 1978). Drama and role play should be included, to provide opportunities for interpersonal problem-solving and for the disabled child to demonstrate positive social overtures (Strain & Kerr, 1981; Vaughn, Ridley & Cox, 1983): for example, giving out classroom treats should help the child to be perceived as a rewarding person (Kerby & Tober, 1970; Sainato, Maheady & Shook, 1986). Positive attention, as well as verbal and physical prompts, should be given in a way that is not intrusive upon interactions with peers. Finally, the teacher should arrange for generalisation of the child's social skills by providing opportunities for interaction with a variety of people and in a number of different settings (Vaughn, Boe & Lund, 1985). It should be noted that these suggestions refer only to the development of social skills and are not concerned with the need for programming in other areas, such as fine and gross motor development, which may be necessary to ensure that the child with disabilities can physically participate in play, demonstrate independence with personal skills such as feeding, dressing and toileting, and develop the appropriate language and communication skills required to participate in the social environment of the preschool.

PREPARING FOR THE NEXT ENVIRONMENT

In the previous discussion, suggestions were made whereby a preschool could function to *facilitate* the social skill development of children with disabilities. However, the strategies identified here were also selected with a view to *preparing* the children for their next environment, in this case, the school. This third approach to integration, incorporating aspects of both the facilitating environment model and the direct intervention model, has been termed the *preparatory model* (Walter & Vincent, 1982). According to this view, the social skills needed by preschool children to ensure success in each stage of their education (i.e. preschool and later, regular school) should be identified and nurtured before the children reach this stage. Vincent suggests that objectives for social skills learning that will prepare children to function adequately within, and to profit from preschool and then school placement, include the following:

1. Ability to initiate interaction appropriately with teachers and peers.
2. Ability to stay appropriately on task when not interacting.
3. Sufficient compliance with classroom rules and routines so as not to require excessive amounts of teacher time for behaviour management.
4. Ability to meet the task requirements of the classroom, or at least to approximate appropriate levels of success.

In her studies of children's progression through preschool to school, Vincent notes that the success in placement of children with disabilities rests not only on their acquisition of developmental skills but also on the acquisition of so-called 'survival skills', or social behaviours needed to function successfully in regular educational settings. She suggests that the teachers of children with disabilities should formulate goals for each child which lead to the development of those competencies which are necessary for the child to successfully function in the next environment (Vincent et al. 1980). In this, Vincent argues for the use of the preparatory model in the integration of children with disabilities at the preschool level.

This third approach, inspired by Vincent's notion of 'the next environment', offers a viable alternative to the two preschool integration models described earlier. It relies on an early intervention program providing the children with adequate entry skills in language, motor and personal-social areas prior to their enrolment in preschool, together with the provision of adequate support to ensure the continued successful integration of the children in the preschool. This third, preparatory model, was followed in the study that is described in the next section of this chapter.

THE STUDY

The study described here concerns the social behaviour of two groups of Down's Syndrome children, a younger group enrolled in regular preschools and an older group enrolled in the regular school system. It focuses primarily on the social interaction of these children with their peers in integrated settings and explores the use of the preparatory model as an effective method of facilitating integration. (A report on the subsequent academic performance and social acceptance of these children and other participants in the early intervention project is given in Pieterse and Center, 1984). This approach, based on generalisation of skills from a segregated early intervention preschool to the regular preschool, has the attraction of satisfying the principles of normalisation, since each child is enrolled in his or her own local preschool. It is also consistent with research evidence cited earlier, which indicates that there is increased likelihood of parallel or cooperative play with peers when integration involves a single handicapped child. The preparatory preschool integration model is followed by maintaining part attendance of the study children at the segregated setting of the early intervention program, where specialist teachers are available to focus on specific skills training as required, at the same time as they are enrolled in their local preschools. This precludes the disruptive effect of direct teacher intervention in the regular preschool situation. One major advantage of this model is its applicability to the Australian situation, where early intervention programs usually deal with handicapped children between birth and 3-4 years of age, after which they are usually accepted into regular preschools. While research projects overseas were able to demonstrate a significant increase in social play when handicapped children were integrated rather than segregated (Jenkins, Speltz & Odom, 1985), as noted earlier, these studies were usually conducted in artificial settings that included, for example, a ratio of eight handicapped to four non-handicapped children. Interest in this study was in observing the social interaction of the Down's Syndrome children placed in the natural setting of their local preschools on a 20:1 basis and the behaviour of a similar group with similar early experiences when they were subsequently integrated into regular primary schools.

METHOD

SUBJECTS

Three groups of children were involved in the study. Two of the groups comprised children who had the classic Trisomy-21 form of Down's Syndrome. The other group included children who were not disabled. All the Down's Syndrome children had been enrolled in an early intervention program at Macquarie University.

The *Younger Down's Syndrome* included four boys who were aged from 53 to 60 months (mean 55 months) when assessed prior to the commencement of the study. All had received early intervention from soon after birth and had also been enrolled in a regular preschool for up to two years. At the time of the study, they were attending a highly structured preschool class associated with the intervention program on three days each week and a regular preschool near their home on one or two days weekly. When assessed before the study began on the Developmental Skills Inventory (Pieterse, 1981), a set of age-related items covering four broad areas, the children were shown to be most advanced in gross motor skills, with the most marked delays in fine motor skills and expressive language. In the area of personal/social skills and language comprehension, the children were only

mildly delayed. According to these results, the children appeared to be functioning at a mildly delayed level at the time of the study (Pieterse & Cairns, 1981).

The *Comparison Group* was formed by matching each child in the Younger Down's Syndrome group by age, sex and length of time in regular preschool with a child from his preschool group.

The *Older Down's Syndrome Group* comprised four children (two girls and two boys) who had left the early intervention program and been enrolled in their regular school at the beginning of the year in which the study was carried out. At the commencement of the study, the children were aged from 72 to 88 months (mean 80 months) (Pieterse, et al., 1979).

OBSERVATION PROCEDURES

Information on aspects of the children's social interaction and play behaviour was collected using a scale developed originally by Parten (1932) which has been used in a number of recent studies, both to classify play behaviours and to plan and evaluate interventions (Bailey & Wolery, 1984; Copeland & Golden, 1979; Fredericks et al 1978; Wintre & Webster, 1974). The time sampling procedure used in the study was similar to that described by Fredericks et al. (1978), with an intermittent schedule in which the observer watched the target child for ten seconds, classified and recorded the major activity to occur in that time period in terms of four categories (material usage, level of social play, mode of interaction and imitation) and then re-observed after an interval of twenty seconds. Beeps were pre-recorded onto a cassette recorder to alert the observer to observe/record periods. The scale was pre-trialled at two preschools and some modifications to the procedures were introduced as a result. For example, initially an attempt was made to minimize variation in observational samples by directing children at the beginning of each observation period to specific activity areas, such as sand-play or home corner. However, these activities were not always available at the time observations were made, so, as an alternative, observations were made during the same one hour time period each week for each child. During these periods, the target child was kept in full view, and any attempt by the child to interact with the observer was ignored. Reliability of 80% was achieved between observers prior to the commencement of the study.

Observations were carried out by three teachers who were associated with the early intervention project. Data were collected at the local preschools and in the early intervention classroom over a thirteen-week period between May and August, while the older handicapped children were observed during recess in Terms 2 and 3, when they had been in school for more than six months. It should be noted that information on only one of the categories included in the observation schedule (level of social play) was collected in the early intervention classroom and in the school playground.

Data collected during observation sessions were analysed in terms of the number of 10 second intervals in which the categories of behaviour listed in the observation record sheets were observed to occur. Results are reported in terms of the percentage of occurrence of each category of behaviour across all observation sessions for each child. In view of the small number of children involved in the study, no tests for the significance of the differences observed in the data were attempted.

RESULTS

Information on the percentage of time that the Down's Syndrome preschool children and their matched peers were observed playing alone, parallel to and in interaction with other children are set out in Table 1.

Table 1 Mean percentage and standard deviation (S.D.) of observed time intervals spent alone, alongside or in social interaction by Down's Syndrome and Comparison Group children in three settings.

	Type of Activity					
Group and Setting	*Alone*		*Alongside*		*Interactive*	
Younger Down's Syndrome (N = 4)	*Mean* %	*S.D.*	*Mean* %	*S.D.*	*Mean* %	*S.D.*
Early intervention classroom	19.5	4-52	22.7	15-30	57.8	40-81
Local preschool	37.5	19-47	43.8	29-59	18.7	7-24
Comparison (N = 4)						
Local preschool	14.5	7-22	51.5	45-65	34.0	17-44
Older Down's Syndrome (N = 4)						
School playground	9.4	0-20	24.6	10-37	66.0	42-90

Not surprisingly, the younger Down's Syndrome children spent a higher mean percentage of the time intervals observed (58%) in interactive play in the early intervention setting with their more familiar peers, most of whom they had known since infancy, than with the less familiar children in the local preschool (19%). This difference was most evident in results for two children who engaged in interactive play for 76% and 81% of the time intervals observed in the early intervention classroom and only 13% and 14% in the integrated, local preschool, where, as with the other Down's Syndrome children, most of their time was spent in isolated (19 and 44%) or parallel play (56 and 32%, respectively). This contrasts with the mean scores of the Comparison Group children who spent only 14% of the observed intervals in isolated activities and as much as 34% in interactive games. However the data reported for the older Down's Syndrome Group suggest that by the time they entered school, these children had learned to play interactively with their non-handicapped peers, with the percentage of time spent alone, alongside and in interaction comparable to that observed in the familiar setting of the early intervention classroom. No comparable data were collected from other children in the school playgrounds, so it is not clear whether the level of interaction observed in these older Down's Syndrome children was equivalent to that of their non-handicapped peers.

The results presented here are consistent with those reported by Fredericks et al. (1978) in an intervention study involving the integration of six moderately to severely disabled preschool children into a regular day care classroom. Prior to intervention, the handicapped children in this study spent almost 66% of their time in solitary or onlooker activities and 17% in parallel play, in contrast with their peers who in the same setting spent only 7% of their time playing alone and 60% in parallel activities. Following 6 months intervention, the rate of isolated play in the children with disabilities was reduced to 23%, parallel play increased to 45% and social interaction to 17%. Fredericks et al. suggest that the changes in patterns of play observed in the disabled children in their study resulted from the training received by the children, but part of the effect could also have reflected an increase in the relative familiarity of the children with whom the disabled subjects were interacting.

Data for the three other categories of information (material usage, mode of interaction and imitation) collected during observation of both Down's Syndrome and Comparison Group children at their preschools showed that there were some areas in which the two groups of children differed markedly in their behaviour at preschool but other areas in which there was little difference. For example, in over 90% of observed time intervals, both groups demonstrated appropriate use of materials, highlighting the importance of the prior instruction received by the Down's Syndrome children in the preparatory environment of the early intervention classroom. The incidence of imitation was also consistent (though low) across both groups. However, there were differences between the Down's Syndrome and Comparison Group children in the type of interaction that was observed. A higher percentage of intervals coded as non-verbal interactions were recorded for the Down's Syndrome children (63%) than for the Comparison Group (37%), but many of these exchanges included a verbal component combined with a physical action. Differences were also noted in the number of intervals in which physical interactions were observed, with the Down's Syndrome children showing a higher rate of aggressive behaviour than the Comparison Group (10% compared with 1% of time intervals). The Down's Syndrome children also initiated many more interactions with other children than the Comparison Group (47% of intervals compared with 30%, respectively). However, observers noted that this difference was related to their inability to remain at an activity or on a verbal topic for more than 2-3 interactions. Apparently the Down's Syndrome children were interested in interacting with other children in the preschool but were unable to sustain the interaction successfully.

DISCUSSION

A number of issues are raised by the material reported here, concerning social skill development in children with disabilities. Two points will be considered in detail, concerning the influences of factors associated with the setting on social interaction and the significance of preparation for the next setting as an important objective in early intervention.

1. The influence of setting on social interaction

There were differences in the social behaviours produced in the younger Down's Syndrome children in the two settings in which they were observed: early intervention classroom and local preschool. These two settings could be differentiated on a number of dimensions that may have had an impact on the social behaviour of the children, including the following:

1) Number of Children. The early intervention program had only 6 children in each class group, whereas the preschool may have had 20 in a group, with as many as 40 children mingling during periods of free play in a single morning or afternoon session.

2) Familiarity of the children. The early intervention class group had remained almost stable since the children entered the Toddler Class (Pieterse & Treloar, 1981), so the four children in the study had spent together at least two hours daily, three days a week since around the age of 18 months. In contrast, they had each attended their local preschool for only one or two sessions each week, over the previous 12-24 months.

3) Pupil-teacher ratio. There were at least two teachers, often assisted by a volunteer or trainee teacher, present each day in the early intervention classroom, whereas regular preschools usually have a child/adult ratio of 10:1. Therefore the level of adult

support available to encourage and assist in the development of social interaction skills in the early intervention classroom was very high when compared with the situation in the local preschool. However, it must also be acknowledged that the number of possible peers who might have interacted with the handicapped children was much less in the early intervention setting than in the preschool, which offered a wide source of possible friends for the children with disabilities. Moreover, as noted earlier, the high ratio of adults to children in the intervention classroom may have tended to inhibit interaction between children in that setting.

4) Level of structure in the setting. The early intervention program operated on a preparatory model, using a highly directed and intensive teaching mode, with a finely detailed program that included identification of precise teaching objectives, several ten minute, one-to-one teaching periods each session and daily charting of progress. Each day's program was therefore organized to ensure the most rapid achievement of current objectives: for example, if a current goal was to teach social interaction skills such as turn-taking or sharing, appropriate games were set up to provide opportunities for learning and children were helped, through modelling, prompting and use of positive reinforcements, to take turns with other children.

   In contrast, while the preschool also provided a very carefully structured program, this took a different form in accord with the facilitating environment model. For example, the three year olds' room had a range of puzzles and other activities set out each day that were different from the puzzles and activities arranged in the four year olds' room, although more difficult materials were sometimes put out in each room for children who needed extending. Similarly, appropriate puzzles and games were available for 'high risk' or disabled children, so that they could take part in activities with other children and did not appear to be different, nor have to be withdrawn from the group for special help.

From the factors identified here, it would appear that the early intervention program provided a setting in which the handicapped children had opportunities to accelerate their social skill development, both in terms of interacting with adults (their teachers) and peers (the other children in the program). Such skills were evident in the results reports from observation of Down's Syndrome children in their early intervention classroom where the level of interactive play was higher than that observed with the Comparison Group in the local preschool. The tendency for the younger handicapped children in the integrated preschool setting to initiate interaction at a higher rate than their non-handicapped peers, but to spend less time in interactive games, suggests that these children may have been functioning in much the same way as younger children in mixed age groups, in social exchanges with older children (see earlier discussion in this paper). This, together with reports of recent research on the use of peers as therapists (cited earlier) could support the proposition that children with disabilities may be more successful socially, if they are placed with younger children, rather than their age-mates in integrated settings. Subsequent research may clarify this issue.

2. Planning for the next environment

As noted earlier in this chapter, the aim of the preparatory model that formed the basis of the early intervention program in which the Down's Syndrome children were enrolled was to prepare the children with appropriate skills, so that they could survive, with support, in a regular preschool. Preparation for the next environment is an important objective in early intervention. The data reported here demonstrate the impact of that preparation, when preschool Down's Syndrome children, their non-handicapped peers and older Down's Syndrome children are compared in terms of the level of their social interaction observed during their play in different settings. At the preschool level, the Down's Syndrome children interacted more often with their peers when in the smaller more familiar setting of the early

intervention program classroom which had been structured by specialist staff to facilitate both physical and verbal interaction among children than in their local preschools. By the time the children had reached school-age, the occurrence of interaction with their non-handicapped peers in more normalized settings, such as the school playground, had increased as a proportion of their playtime activities.

A vital component of the early intervention program was attendance at regular preschools, but this was only implemented once certain prerequisite skills such as appropriate use of materials, ability to follow directions and so on were attained in the segregated setting. In the local preschool setting, the children observed in this study demonstrated appropriate use of materials at levels that were similar to those observed among their non-handicapped peers. Interaction with peers also occurred in the local preschool, although at a lower level than had been observed in the early intervention classroom, and at a lower level than their non-handicapped peers. However, an increase in the occurrence of these skills was observed among the older Down's Syndrome children attending regular schools. This suggested, not unexpectedly, that continued experience with non-handicapped children resulted in greater competency in the techniques of peer interaction.

CONCLUSION

In view of the amount of effort that must be invested in any teaching program designed to facilitate development in children with disabilities, a dilemma faces many special educators: whether to focus on the immediate needs of the children, in view of their current life situations and most urgent problems, or to look ahead and give priority to skills that will assist the children to move on to the next, hopefully more normalised, environment which would include, for the children in the study described here, enrolment in a local preschool, or for older children, enrolment (and maintenance) in a regular school. The data reported in this chapter demonstrate that for social skills, the preparatory model of early intervention where prerequisite behaviours are specifically targeted as part of the teaching program, may help to ensure a successful outcome in integration of disabled children into both local and the regular school system.

Chapter 5

EVALUATION OF AN EARLY INTERVENTION PROGRAM FOR LANGUAGE-DELAYED CHILDREN

Sandra Bochner
Penny Price
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How 'special' are the educational services currently being provided for children who cannot learn effectively within the regular classroom? Over recent years there has been a dramatic increase in the provision of services for handicapped learners, particularly for young children with developmental delay. Clear evidence of this is in the formation in New South Wales of an Early Intervention Association, which by 1983 had over 80 members. Many of the early intervention programs that have been established throughout Australia are funded through government grants, on the basis of submissions made by community groups. Usually the funding body requires regular reports on programs that have been funded. However, such reports often contain only a financial statement and a description of the operation of the program, rather than a more formal evaluation of its impact on clients. In a sense, these programs are accountable financially, rather than educationally.

This chapter is concerned with issues relating to the topic of accountability in the provision of early intervention services. Results are reported from a language-intervention program operating in Sydney that has been funded as a community-based, early intervention service since 1981. Conclusions are drawn about the effectiveness of this program and about evaluation in general in the provision of such services for developmentally-delayed children.

ISSUES IN PROGRAM EVALUATION

In setting up an early intervention service for developmentally-delayed children that provides for on-going evaluation of program effectiveness, an appropriate evaluation model must be selected and assessment tools identified. Some issues to be considered in relation to these decisions include the following:

1. Selection of an evaluation model

Educational programs are usually evaluated using research designs that include: matched groups, single case studies or comparison of pre- and post-test results.

a) Matched groups:

One of the most effective ways to demonstrate the impact of a particular intervention procedure is to use a design that includes matched groups, usually an experimental group which receives the program to be evaluated, a control group which receives no program and sometimes a contrast group which is given some other program of equivalent duration and staffing. The children are tested in the relevant skills before intervention begins and after it ends: results are then compared to find out if there are any significant differences in gains made by the three groups. However, this approach presents the special educator with a number of practical problems. For example:

(i) Children involved in special education programs tend to present with a variety of handicapping conditions; as a result, variability in the characteristics of children likely to participate in a program makes matching of groups very difficult.

(ii) There are always problems in the control of factors that may influence results: for example, the skills and preferences of teachers can affect the impact of a program rather than its content or the teaching method used.

(iii) There is often a moral question to consider if a program is withheld from some children (control and contrast groups) for research reasons, when it is felt that they will be disadvantaged by having such services denied them. This difficulty can be minimized by inclusion of these children in the program at a later date, after the research project has been completed.

(iv) Setting up evaluations that include matched groups is costly, since many extra children must be tested at least twice and as a result, additional salary costs must be met. The expenses involved in this type of evaluation are usually beyond the resources of most groups providing intervention services.

b) Single case study designs:

One solution to the problems presented by matched group designs in evaluation is to consider each child as a single case study. Information can then be reported about progress of individual children within the program and comparisons made in terms of the particular problems presented by each child and the kinds of solutions that were found. Much useful information can be gained by such a research method. However, it can be difficult to make generalizations about program effectiveness on the basis of a number of case studies and the procedure becomes cumbersome as the number of children receiving a program increases.

c) Pre- and post-test designs:

The use of pre- and post-test data to demonstrate changes in behaviour during the intervention period is one of the weakest design strategies that can be used, since it is often impossible to isolate the variables that were causal in any changes that occurred. For example, changes may be as much a result of regression towards the mean as of any procedure introduced during intervention. However, apart from single case studies, this is often the only method that can be used, in that test results can be collected routinely as part of program implementation procedures.

One strategy which may be used to minimize the weaknesses inherent in pre- and post-test designs is to compare the results obtained by various sub-groups within the program. Comparisons can be made in terms of child characteristics (age of entry, developmental age at entry, type of disability, sex, position in family), program characteristics (year of intervention, teacher characteristics, program location) or program effects (degree of change, parental satisfaction) and so on. In the following section of this report, this approach to program evaluation is used. Comparisons are made between results obtained

by groups of children considered in terms of chronological age, level of delay in language development at the time of entry to the program and degree of change in language age following intervention. These comparisons may highlight the groups of children who benefitted most from participation in the program; they demonstrate one approach to the evaluation of community-based early intervention programs.

2. Selection of assessment instruments

Where evaluation of program effectiveness is to be achieved through analysis of test results collected at the beginning and end of an intervention period, careful attention has to be directed to the selection of the assessment procedures. Three types are currently used in special education: criterion-referenced tests, standardized or norm-referenced tests and informal methods which may include checklists, rating scales or structured and semi-structured observation. Issues to be considered in the use of any of these procedures relate to factors such as the validity and reliability of scores. For example, does the assessment procedure provide information about the behaviour that the intervention program is designed to develop or modify? There is little point in using a test if it provides no information about the behaviour changes that would be expected from implementation of the intervention program, or if there is only an indirect relationship between test results and the intervention. This issue is most likely to arise when a search is made for appropriate standardized tests. For example, intelligence tests are often used in program evaluation because they are publicly recognized and enable comparisons to be made with data from other studies. However, frequently the skills being assessed in these tests have little relationship to the skills being developed in the program.

Questions about reliability can cause particular difficulties when standardized tests are administered to young handicapped children. Such children are often very difficult to test, either as a result of non-compliant behaviour or simply because it is difficult to judge the extent to which their test performance is prejudiced by factors arising from their handicapping condition.

When selecting an assessment procedure for evaluation of an intervention program, a number of questions not directly linked to validity and reliability may arise. For example, if a standardized test is to be used, was it normed on a group of children similar to those who will be involved in the program? If not, what differences should be expected between the children on whom the test was standardized and the present group? Should changes be made to any part of the test to provide for these differences and will such changes invalidate the test results? For example, changes may be required in the language of administration (e.g. alteration of item labels because of cultural differences), adjustments to allow for individual disabilities (e.g. nodding rather than pointing), or allowance for inadequate prerequisite skills (e.g. reading the test items for non-readers).

THE STUDY

METHOD

This chapter is concerned with the evaluation of an intervention program that was established in 1979 to provide assistance for children who were having difficulty in the acquisition of early language skills. The program was based initially on a program outlined by Horstmeier and MacDonald (1975), which provided training for parents of children with

language difficulties (MacDonald, Blott, Gordon, Spiegel & Hartmann, 1974). The critical features of the program (Bochner, Price & Salamon, 1982; Bochner, Price, Salamon & Richardson, in press) are that it is relatively short term (children and parents attend an individual, weekly session over a twelve week period, with less frequent content over a further twelve weeks), and involves teaching parents to implement language objectives in the children's natural environment.

This paper presents results obtained from administration of a standardized test (Sequenced Inventory of Communication Development, SICD; Hedrick, Prather and Tobin, 1975) that was used from the beginning of the project as part of the battery of assessment procedures given to children at the time of entry to the program and at the end of the intervention phase, to measure progress over the intervention period. Some information about the development of the test is included in the manual. For example, it is reported that it was normed on 252 children between the ages 3 to 49 months, with three levels per year (4, 8 and 12 months) and 21 children at each age level. All the children were white, from English-speaking backgrounds, without known hearing difficulty or mental or physical problems and were equally divided on the basis of sex. Items in the test were scored on a pass/fail basis and placed at the age level at which 75% of children were successful.

Data on the validity and reliability of the test are also reported in the manual. For example, as a measure of validity, SICD scores of the children on which the test was normed were compared with scores on three other measures of language, including the Peabody Picture Vocabulary Test (Dunn, 1965), mean length of utterance and a sentence complexity score. Correlation coefficients obtained ranged from .74 to .82. The children's receptive and expressive scores correlated highly (.95) and their mean receptive and expressive communication ages were close to chronological age. Perhaps of most importance for the purpose of this study, the test appeared to have face validity in terms of the content of the intervention program that was being implemented.

One difficulty with the SICD is that scores are reported in 4 month increments. This report is concerned with an intervention program which covered a six month period, so the test may not be sensitive to small changes in children's skills between pre—and post-test. However, while the SICD has limitations as a measure of change in communication age over a limited time period, it does provide a means for demonstrating change in children who would be largely unassessable on other standardized measures of communication.

In a study designed to compare the level of agreement between three standardized tests of language development (including the SICD) and clinical judgement about normal or impaired language development, Allen, Bliss and Timmons (1981) concluded that 'evaluation of impaired language behaviour among three year olds is more an art than a science at the present time.' One of the major difficulties associated with these tests resulted from variations in the behaviours assessed in each instrument. Apparently a major factor in the selection of a measure of communication is to identify a test that samples behaviours that are likely to be affected by the intervention program. On these grounds, use of the SICD, in spite of its acknowledged limitations, appears to be justified.

When looking for an appropriate assessment procedure to use in program evaluation, useful information may be obtained from reports published by other similar programs. However, such reports are often difficult to locate, since those involved in intervention are often too busy to compile and disseminate relevant information to others working in the field. Yet such reporting is an important aspect of any intervention program and every effort should be made to take this final step in the process of developing effective strategies for helping children with special needs to learn more effectively.

SUBJECTS

A total of 145 children participated in the project over the first four years of its operation. The children had a wide variety of handicapping conditions, including Down's Syndrome, cerebral palsy, brain damage at birth and 'unknown causes', but all showed some evidence of specific delay in the acquisition of language. This report is concerned with the 135 children for whom SICD pre—and post-test results are available, 82 (61%) of whom were boys and 53 (39%) girls. (Ten children were not available for re-testing, as a result of illness, or transfer of family out of Sydney).

The age distribution of the children, presented in Table 1, shows that 70% were between 24 and 47 months of age at the start of the intervention. However, their level of delay, as measured by the SICD, is of more significance to the topic of this report, and details of both expressive and receptive communication ages (ECA and RCA) at pre-test are included in Tables 2 and 3. These show that delay in the children's communication development was greater in expressive, rather than receptive skills. For example, nine children demonstrated no delay in receptive skills but only one child had no delay in expressive skills; while 15 children were more than 36 months behind in expressive skills, compared with only 5 who had comparable levels of delay in receptive language. A breakdown of the groups at the various levels of delay by chronological age, is presented in Tables 2 and 3.

Table 1 Chronological Age Distribution

Months	f	%
Less than 24	14	10
24-35	55	41
36-47	40	29
48-59	21	16
60 +	5	4
TOTAL	135	100

Table 2 Percentage delay in RCA[1] scores by chronological age

	Chronological Age (months)					
RCA Score delay (months)	24 %	24-35 %	36-47 %	48-59 %	60+ %	Total %
No delay	14	11	2			7
6	57	22	5			16
6-11	22	31	30			24
12-23	7	36	55	52		40
24-35			8	38	40	10
36«				10	60	3
Sample Size	14	55	40	21	5	135

[1]receptive communication age on the Sequenced Inventory of Communication Development (Hedrick, Prather & Tobin, 1975).

Table 3 Percentage delay in ECA[2] scores by chronological age

ECA Score delay (months)	Chronological Age (Months) 24	24-35	36-47	48-59	60+	Total
No delay	7					1
6	50	9				9
6-11	21	29	5			15
12-13	22	51	73	14		47
24-35		11	17	43	20	17
36«			5	43	80	11
Sample Size	14	55	4	21	5	135

[2]expressive communication age on the Sequenced Inventory of Communication Development (Hedrick, Prather & Tobin, 1975).

As would be expected, the greatest delay, in both receptive and expressive skills (36 months or more), was found among the oldest children (l4 out of l5 were 4 years of age or more), while all but one of the children showing no delay in one or other language skill were in the younger age groups (less than 36 months for receptive and 24 months for expressive language age). It is interesting to note that the Bayley Scales of Infant Development (Bayley, 1969) place the use of first words at the 14.2 months age level, while Rieke, Lynch and Soltman (1977) include first words at the 20 month level in their profile of early language skills. The SICD also places first words at the 20 month level, though it is noted in the manual that, by 12 months, between 25-49% of children in their sample had begun to use consistent sound combinations as words, and, by 16 months, 50-74% of the children had achieved this skill. It is not surprising therefore that most children were referred to the program at some time after their second birthday. The children who entered the program earlier generally had some known handicapping condition (e.g. Down's Syndrome) which is usually associated with a delay in the acquisition of language.

A major objective in the analysis of test results is to identify the impact of the program on children at various age levels. In the following section of this report, the degree of change recorded in SICD scores is examined in terms of the level of delay evident at pre-test in children entering the program. This could shed light on the groups of children who appear to benefit most significantly from participation in the language training project.

RESULTS

In order to discover how effective an intervention program has been for the children participating in it, it is first necessary to estimate the level of development in communication skills that would have been attained if the children had not received any assistance from the program. SICD scores are expressed in terms of age: thus a child who is developing at a normal rate should score at his chronological age level on the test, although, because the increments on the test are at 4-month intervals, the child may achieve a score that is up to 3 months above or below his chronological age. The relationship between chronological age and communication age should be linear in a child who is developing normally. Where a child is developmentally delayed, it is likely that the relationship between the two ages remains consistent, but with the distance between the two continually widening, as the

child slips further and further behind his normally-developing peers. Indeed, it may be predicted that the discrepancy between chronological age and communication age for normal, mildly and severely delayed children will steadily widen if no steps are taken to increase the rate of development of the delayed child, particularly when the child is more severely handicapped. If successful intervention occurs, then the discrepancy between the developmental level achieved by the handicapped child will be closer to that reached by non-handicapped peers.

In thinking about the degree of change in communication age that may be expected over a 6-month period for severely, mildly and normally developing children, it should also be noted that the more delayed the child at the start of intervention, the greater will be the gains that must be made during the intervention period for the child to approximate a normal level of development. For example, without intervention, a child who is mildly delayed may be expected to achieve a gain of around 4 months over a 6-month period, while a child who is severely delayed might only increase his or her test scores by 2 months over the same period. This differential rate of development has important implications for the results to be reported from the language program, particularly in view of the 4-month increments that can be recorded on the SICD. Thus a gain of 4 months in test score by a mildly delayed child does not represent as significant a gain as 4 months in the test scores of a more severely delayed child.

One other issue to be kept in mind, when considering the results obtained in the language program, relates to the use of 4-month levels in SICD ages. As a result of the use of these age levels, the test is relatively insensitive to small changes in performance. This difficulty is likely to have its greatest impact on children who are more severely delayed, since the small but important gains made by such children may not be reflected in a change in the SICD scores recorded at the start of the program.

In attempting to identify trends in SICD results with particular groups of children, a major problem was to find a way to express changes in scores so that comparisons could be made between children who differed widely in terms of chronological age and language age at pre and post test. The chronological age of children enrolled in the program varied widely, as did the level of delay in communication skills and the changes that occurred in SICD scores over the intervention period. It was therefore decided to express changes in scores between pre and post test in terms of four categories:

1. **No change.**
2. **Minimal change:** an increase of 4 months.
3. **Moderate change:** an increase of 8 months.
4. **Extensive change:** an increase of 12 months or more.

These classifications are used in Tables 4, 5 and 6 to describe results achieved by children at different chronological age levels following intervention. The distribution and classification of possible combinations of change in scores between pre and post test are listed in Table 4. This shows that seven children (5%) made no gains in either receptive or expressive language. However, nine children (6%) made extensive gains in both receptive and expressive language, while 26 (19%) made extensive gains in one or other skill. A number of the children (40%) made at least moderate gains in one or both language skills.

Is it possible to identify the children who showed greatest gains in the program in terms of some common characteristic, such as chronological age at time of entry, or the level of delay evident in their pre-test SICD scores? Tables 5-8 provide some data of this type.

Table 4 **Frequency (f) of increases in RCA and ECA scores by degree of change between pre and post test.**

Degree of change(1)	Communication Age Increases (in months) RCA	ECA	f	Number of Children Total	%
None	0	0	7	7	5.2
Minimal	0	4	10		
	4	0	14		
	4	4	24	48	35.6
Moderate	0	8	10		
	8	0	7		
	8	8	8		
	8	4	10		
	4	8	19	43	40.0
Extensive	12	0	1		
	0	12	2		
	12	12	9		
	12	8	1		
	8	12	3		
	12	4	3		
	4	12	7	26	19.2

(1) Classification of change following intervention:
None (no change)
Minimal (increase of 4 months)
Moderate (increase of 8 months)
Extensive (increase of 12 months or more)

Table 5 **Percentage change in RCA scores by chronological age**

Change	Chronological Age (Months) %	%	%	%	%	%
None	7	16	28	33	—	21
Minimal	36	53	52	24	100	48
Moderate	43	22	10	29	—	21
Extensive	14	9	10	14	—	10
Sample Size	14	55	40	21	5	135

Table 6 **Percentage change in ECA scores by chronological age**

Change	Chronological Age (Months) %	%	%	%	%	%
None	43	20	15	24	20	21
Minimal	22	38	38	28	40	35
Moderate	21	31	27	24	40	28
Extensive	14	11	20	24	—	16
Sample Size	14	55	40	21	5	135

When changes in scores are considered in terms of chronological age, as in Tables 5 and 6, two patterns are evident. Firstly, dramatic changes did not occur with the older, more delayed group of children. As would be confirmed by many teachers of developmentally delayed children, it is difficult to achieve rapid changes in the level of functioning of more severely delayed, older children. However, as suggested earlier in this paper, if account is taken of the rate of development that had been evident in this group prior to intervention, then gains of 4-8 months over a 6 month period may be just as significant as more extensive gains among younger, less-delayed children. Secondly, in relation to both receptive and expressive skills, gains were greatest among the children aged between 24 and 35 months at the start of the program. The 36-47 months group showed a similar though less marked, trend. It is interesting to speculate if the younger, less delayed group of children would have 'caught up' with their peers if intervention had not occurred. However, in defense of the program, it may be argued that if intervention had not occurred, the slight delay presented by these children at an early age would have increased over time, along the lines suggested in Figure 1. The trend evident in Tables 2 and 3 for increasing levels of delay with increasing age lends some support to this view.

Is there a relationship between the level of delay evident when SICD scores are compared with chronological age and the degree of change that occurred between pre- and post-test? Information relating to this issue is contained in Tables 7 and 8 which show the level of delay in receptive and expressive skills in relation to the degree of change in scores that was observed over the intervention period. Several points can be made about the information contained in these tables. In relation to the children who were most seriously delayed in receptive skills, the intervention appears to have had only limited impact, with only one of the five children in the group demonstrating moderate gains in test scores. On the other hand, in expressive skills, the most delayed children showed higher levels of improvement, with eight of the 14 children producing gains classified as moderate or extensive. Since the major focus of the program was on the development of expressive language, this result is pleasing. Approximately half of the children who showed no change in either receptive or expressive skills were in the 12-23 month delayed group, but since the largest proportion of children demonstrated this level of delay in both receptive and expressive skills, it is not surprising that this group is strongly represented within all the change subgroups.

Table 7 Percentage delay by degree of change in RCA scores.

Delay (months)	Degree of change None	Minimal	Moderate	Extensive	Total
No delay	7	11	—	—	7
< 6	21	15	18	7	16
6-11	18	28	25	15	24
12-23	43	31	43	71	40
24-35	11	9	11	7	9
36+	—	6	3	—	4
Sample Size	28	65	28	14	135

Table 8 Percentage delay by degree of change in ECA age

Delay (months)	None	Minimal	Moderate	Extensive	Total
	%	%	%	%	%
None	—	2	—	—	1
< 6	14	6	13	—	9
6-11	24	17	10	9	15
12-23	41	53	42	48	47
24-35	14	13	24	19	17
36+	7	9	11	24	11
Sample Size	29	47	38	21	135

Overall, there appears to be no strong pattern of effect evident in the data presented here. However, some tentative conclusions can be drawn from these results:

1. As would be expected from reports of incidence rates for language difficulties, (e.g. Fundudis, Kolvin & Garside, 1979) more boys than girls participated in the early language intervention program.
2. Almost 2/3 of the children were aged between 24 and 47 months at the start of the program.
3. Over 60% of the children demonstrated delays of more than 12 months in receptive language age, as measured on the SICD, while 78% were more than 12 months delayed in expressive skills. Since the program was concerned primarily with the development of expressive language, it would appear that children entering the program demonstrated deficits that were congruent with the overall objectives of the program. Apparently the right children were being accepted into the program.
4. As would be expected, the greatest levels of delay were observed in the oldest group of children; this pattern was most evident in the expressive skills of children aged 48 months or more.
5. Approximately one in five children made no gains in either receptive or expressive language skills over the intervention period. However, 34% made moderate to extensive gains in receptive language and 47% made gains of a similar level in expressive language, as measured on the SICD. Thus it would appear that the program may have had a positive impact on the development of the communication skills measured in the test in more than two out of every five children who participated in the program.

DISCUSSION

The major purpose of this chapter was to draw attention to the need for those involved in the provision of educational services for young developmentally delayed children to be accountable, not only in financial terms, but also in terms of the programs that are implemented. Major issues to be considered in relation to the evaluation of such services were reviewed and data were presented from a standardized test of communication development as an example of the type of program review and reporting that should be carried out routinely within all publicly funded intervention programs.

In seeking to review program effectiveness in terms of test results, a number of problems arise. For example, children receiving this type of service tend to present with a widely differing set of disabilities which makes matching, for control purposes, or grouping into subcategories very difficult. They are often involved at the same time in a range of different services that are all, in various ways, contributing to the overall development of the child.

Thus it can be very difficult to establish precisely what the effect of a particular intervention was on the child, or whether one particular variant of a program was more successful than another. In spite of these problems, some general patterns did emerge in the data presented in this paper.

There was some evidence that children who were delayed in the development of early communication skills benefitted from participation in a program designed to facilitate the acquisition of such skills, though it cannot be clearly demonstrated that the changes observed in their communication skills over the intervention period resulted solely from the program. Moreover, it is not possible to pinpoint what element of the program had greatest impact on the children's communication skills. It would appear, however, that these results provide further support for the principle underlying early intervention: that children who are at risk for delay in their development should be given access to supplementary services at as early an age as possible in order to maximize their rate of development and thus reduce or avoid the need for additional help or special programs at a later age.

Since the program used in this study was dependent on developing skills within the child's primary caretaker, rather than in the delivery of a direct service to the child, the results reported earlier add weight to the argument that in the early stages of a child's development, intervention can be carried out effectively in the home, through parent training, rather than through more costly programs that involve highly trained personnel working in a one-to-one situation with children whose rate of progress is likely to be very slow.

One of the impediments that face those seeking to report results obtained within intervention programs is to identify assessment procedures that will adequately reflect the changes that are achieved in children's behaviour as a result of specific intervention procedures, but that are also publicly recognized and for which norms are available for non-handicapped as well as handicapped children. While those involved in delivering services to developmentally delayed children are usually neither trained nor interested in the development of suitable tests for assessing children involved in their programs, they can contribute to the provision of these materials by reporting data that are collected within their services, so that the pool of information on the performance that may be expected or required for disabled learners is increased. It is difficult to know of both the strengths and weaknesses of a particular test or teaching procedure if information about its effect with a disabled population is not reported. Those delivering services to the handicapped therefore are morally bound to report the results that they obtain, if at all possible.

CONCLUSION

There is a responsibility on all who are involved in the provision of early intervention services for developmentally-delayed children to report on the efficacy of their programs in relation to the levels of development achieved by those who take part. Questions relating to the issue of accountability in special education have been asked with regularity over the years since such services for children with learning problems have come to be provided within education systems (Dunn, 1968; Simeonsson & Wiegerink, 1975). However, at the same time educators have experienced difficulties in identifying procedures to use in documenting changes that occur in the development of children enrolled in these programs (Simeonsson, Huntington & Parse, 1980). Strategies that can be used to overcome some of the methodological difficulties that have plagued much research in special education have been reported by Bagnato and Neisworth (1980), Campbell (1975), Cooper and Rosenthal (1980) and Kavale and Glass (1982). While these procedures may be more

appropriate for use by a researcher more involved in academic rather than 'hands on' experiences with children, it is the data collected by the practitioner in the field that provided the material for these more sophisticated analyses. There is, therefore, good reason for teachers and others to report on the results they achieve, even if the data does not satisfy the more stringent criteria required for such material within an academic situation.

Chapter 6

INTEGRATION OF 36 CHILDREN WITH LANGUAGE DIFFICULTIES

Sandra Bochner
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Most people involved in the provision of remedial programs for children with learning problems within the regular school system would agree that intervention is most effective if it is delivered as early as possible, before the child has time to experience excessive failure and before inappropriate or inefficient strategies for coping are acquired. One of the earliest signs that an apparently intact child may have difficulties at school is the failure to acquire age appropriate language skills; delayed or disordered speech at the preschool level is often associated with later problems in learning (Fundudis, Kolvin & Garside, 1979; Shapiro, Palmer, Wachtel & Capute, 1983; Silva, McGee & Williams, 1983). This paper reports on the school progress of a group of children who had been recognised as being language disabled or delayed prior to their entry into the regular school system.

THE STUDY

The Special Education Centre at Macquarie University operates three classrooms that provide a research-based intervention program for children who are experiencing severe difficulties in some area of learning. One of these classes is concerned with 4 to 5 year old children who have language problems, and are considered to be educationally 'at risk'. In the following sections of this paper, information on test scores and school progress, is reported for 36 children who were enrolled in this class between 1979 and 1983. Such information is of particular interest in the light of current interest among educators (see Australian Association of Special Education Newsletter, December, 1984) in two important and related issues; the integration of children with special learning needs into regular classrooms and the maintenance of such children in these classes during their subsequent years at school.

The report is divided into four sections. Some categories used in New South Wales to classify children with special learning needs are set out, together with information on the rate of occurrence of such learning problems in children of school age. Some relevant definitions are also considered. The second section includes a brief description of the operation of the early language class at the Special Education Centre and an outline of the assessment procedures that were used in the program during the period 1979-1983. Test results collected from the children at the end of the intervention period are reported in the third section and these are discussed in relation to the subsequent school placement of the children. Finally, some conclusions are drawn concerning the school progress of a group of children who were identified at an early age as being educationally 'at risk'.

1. Background Information

1.1 Classification of the children

Children were selected for the Centre class, first, because of their problems in language and, secondly, because they were considered at the age of 5 to be not yet ready for school. None of the children was reported to be hearing impaired, though a number had experienced intermittent hearing loss as a result of Otitis Media. Largely as a result of their language difficulties, but also in some cases as a result of difficult behaviour, it was not possible to establish, prior to entry to the class, the ability level of all the children. In most cases, assessments were completed at the end of the intervention period and, on the basis of information collected at this time, it was evident that the children could be classified in terms of three categories:

i Children with mild intellectual disability: those generally functioning within the IQ range of 55 to 75/80.

ii. Children with moderate intellectual disability: those generally functioning within the IQ range of 30 to 55.

iii. Children with language disabilities; hearing impaired children of average or better ability but with a marked impairment in the understanding and use of language (N.S.W. Department of Education, 1983).

Special educational provision is available in New South Wales for children considered to be in need of special placement who are functioning at a level identified in these three categories, including (respectively) OA classes and schools, OF classes and schools, and OL classes. Children can enter OA classes and schools from 8 years of age, OF classes and schools from 4 years and OL classes from the age of school entry.

1.2 Epidemiology

Epidemiological studies provide some indication of the proportion of children who could be expected to fall into the three categories identified above within a school system. For example, Cameron (1982) reported that 8.6% of the Australian population were identified in a 1981 survey as being handicapped (13.2% were disabled). Within the handicapped group, 10.8% were aged from 0-14 years (3.1% were between 0-4 years, 3.9% between 5-9 years and 3.8% between 10-14 years), while a further 2.8% were in the 15-19 year age group. Of all handicapped persons aged 5 years and over, 24.1% were mildly affected, 20.7% moderately affected and 41.9% were severely affected. (The severity of the handicap was unknown for 13.2% of the sample). Thus, according to this survey, approximately .8% of the population of Australia in 1981 were children who had a handicapping condition, of whom almost half were classified as mildly or moderately affected.

Estimates of the number of children who experience mild to severe learning difficulties at school (many of whom could be classified as mildly intellectually disabled or language disabled) suggest a higher prevalence rate than that cited earlier, though the definition used to identify the children would affect prevalence estimates. For example, in an Australian survey, Andrews, Elkins, Berry and Burge (1979) estimated that while almost 2% of children in regular schools were considered to be mildly to severely mentally, physically or sensorily handicapped, over 10% were in need of specialist help as a result of learning difficulties or behavioural problems. Comparable data are available from other sources (e.g. Fundudis et al. 1979). Special educators surveyed by Tucker, Stevens and Ysseldyke (1983) generally agreed that the prevalence rate for learning disabilities among school age children in the U.S.A. was around 3%. However, when the estimate was broadened to include other low achievers, the proportion rose:

> There are 10 to 15% of children who are educationally retarded, but only 1 to 3% that have an identifiable developmental learning disability. (Samuel Kirk, University of Arizona).
>
> If hyperactivity (social-behavioural) is included, maybe as high as 10%—if academics, perceptual-motor and language areas are used, about 3%. If in geographic area with extreme poverty, maybe 20%. (Esther Minskoff, Madison College).
>
> If one wishes to include mildly disabled children in the group the percentage rises to 10-15 percent and the disability may be produced by the school system itself. I don't consider that a 'disability' but the inadequacy of the system. (Patricia Myers, Education Service Center, San Antonio, Texas).
>
> I believe that most children in the lowest third of every class are the ones who are demonstrating the problems I am referring to. Most of these should not be having academic problems, and I do not think they would be if the curriculum were designed for them instead of expecting them to fit into a rigidly standardized, production-line program so common to most schools. (Gerald Getman, College of Optometry, Fullerton, California).
>
> (Tucker et al., 1983, p10-11)

Belmont and Belmont (1983) suggested that children who experienced problems within the regular school system showed four different patterns: one group, who initially had problems, appeared to catch up over time; a second group coped adequately in the early years at school but later experienced difficulties; a third group fluctuated idiosyncractically over the first six years, with no clear pattern of success of failure; while a fourth group were consistently poor in their performance throughout their primary school years. Belmont and Belmont concluded that it may be possible to identify two categories of children among those who experience difficulties at school: those who show developmental lag, and those who 'are chronically poor learners in all settings (regular class, special class, special school)' (p.499). This distinction may help to explain the variation in prevalence numbers evident in the various sources cited previously.

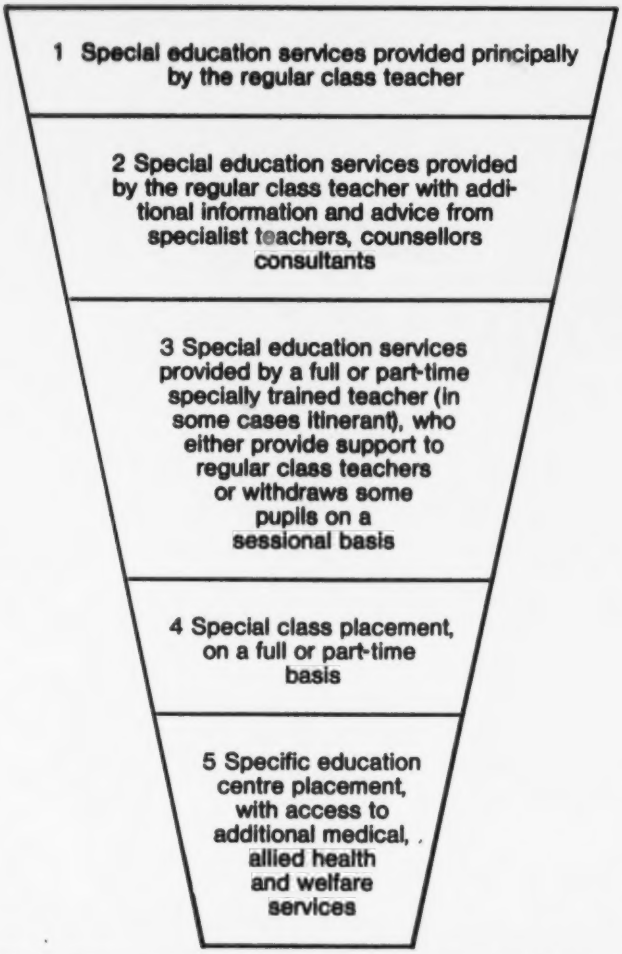
1.3 Definitions

In considering questions related to the placement and later progress of children with special learning needs within the education system, it is important to define the term *integration*, particularly in view of recent variations in interpretation of the word among educators. The main sources of current definitions are Public Law 94-142 (U.S.A.) and the Warnock Report (U.K.), both of which support the notion that handicapped children should be educated 'in the least restrictive environment'. However, this concept has been interpreted in a number of different ways. For example, in its Report for the Triennium 1982-4 (Tannock, 1981), the Commonwealth Schools Commission referred to integration in terms of 'the establishment and maintenance of handicapped students in regular schools' (p.391). A recent report on integration in Victoria takes a similar position.

> The Review's definition of integration refers to two aspects of policy and practice. Both aspects identify processes.
>
> (i) a process of *increasing* the participation of children with impairments and disabilities in the education programs and social life of regular schools in which their peers without disabilities participate;
>
> (ii) a process of *maintaining* the participation of all children in the educational programs and social life of regular schools.
>
> The first process refers to *getting* into the regular classroom those children who are presently segregated from it, while the second process refers to *supporting*, in the regular classroom, children who are at risk of being segregated from it. Both refer to increasing participation (Collins, 1984, p.6).

An alternative interpretation to the concept of *least restricted environment* is set out in Deno's (1970) 'cascade' model of special education provision, which proposes the establishment of an hierarchical system, with increasing levels of separation from normal peers as the particular needs of individual children exceed the resources available at higher placement levels. This approach is followed in New South Wales (Doherty, 1982), where a system has been established which includes provision of a number of different types of support for teachers and children within regular classes, special classes for children with identified disabilities within regular schools and special schools for children with specific handicaps (See Figure I). The first two alternatives (Levels 1-4) would generally be classified as integrated services, though most educators would not consider special classes within regular schools to be fully integrated situations.

FIGURE I The New South Wales cascade model of special education services.


1 Special education services provided principally by the regular class teacher
2 Special education services provided by the regular class teacher with additional information and advice from specialist teachers, counsellors consultants
3 Special education services provided by a full or part-time specially trained teacher (in some cases itinerant), who either provide support to regular class teachers or withdraws some pupils on a sessional basis
4 Special class placement, on a full or part-time basis
5 Specific education centre placement, with access to additional medical, allied health and welfare services

However, while a number of alternatives are available in New South Wales for children who cannot progress satisfactorily within regular class situations, the guidelines used to determine which children will be placed in special classes and school are not explicit. For example, while it is the policy of the N.S.W. Department of Education that every child should be

able to attend the regular neighbourhood school where this is possible and practical and in the best interests of the child, there is also the proviso that:

> the Principal should defer enrolment if the child's disability is considered to be significant or likely to have a significant effect on the learning processes of other children. The determination of significance is to be based on whether the child is deemed to require physical care, behavioural management or educational attention which the regular school may not be able to provide, or which might be better provided in a special education facility. (Policy Statement, July 1981).

Clearly, the guidelines provided to school principals concerning the enrolment of children with special learning needs are very broad, and decisions concerning such enrolments are dependent on the personal judgement of each principal. Guidelines concerning the maintenance of children with specific learning needs within a regular class, or their placement in a special education situation, are also broad, involving consultation between relevant teachers, school principals, district school counsellors and parents. In the light of the uncertainties evident in the earlier discussion of definitions and incidence rates, the looseness of these guidelines is not unexpected.

2. Description of the Program

The early language class at the Special Education Centre provides an intensive remedial program for up to 10 children who have language difficulties and, while ready to move on from preschool, are considered to be not yet ready for school. Children are usually enrolled in the class for one calendar year, though a few children have stayed for a second year. On entry to the class and prior to their departure, children are assessed using both standardized and criterion referenced tests which have usually included the following:

Peabody Picture Vocabulary Test (Revised) (PPVT: Dunn & Dunn, 1981)

Reynell Developmental Language Scales (Revised) (RDLS: Reynell, 1977)

Sequenced Inventory of Communication Development (SICD: Hedrick, Prather & Tobin, 1975)

Uniform Performance Assessment System (UPAS: Haring, White, Edgar, Affleck & Hayden, 1981).

Since 1980, most children have also been given a standardized test of intelligence and IQ scores are also sometimes available from assessments carried out in other centres.

When it is time for a child to leave the class, parents are encouraged to make contact with relevant authorities, to ensure that each child is placed in the most appropriate school situation. Some contact is usually made with each child's school, particularly during the first year, and records are kept on the children's later progress and school placement. Data presented in the following section of this paper were derived from these records, together with test scores collected during final assessments.

3. Results

In this section of the report, two sets of information are presented: first, results collected from tests administered to the children at the end of their period in the program, and secondly, information on the initial placement and subsequent progress of the children within the school system of New South Wales.

3.1 Test results

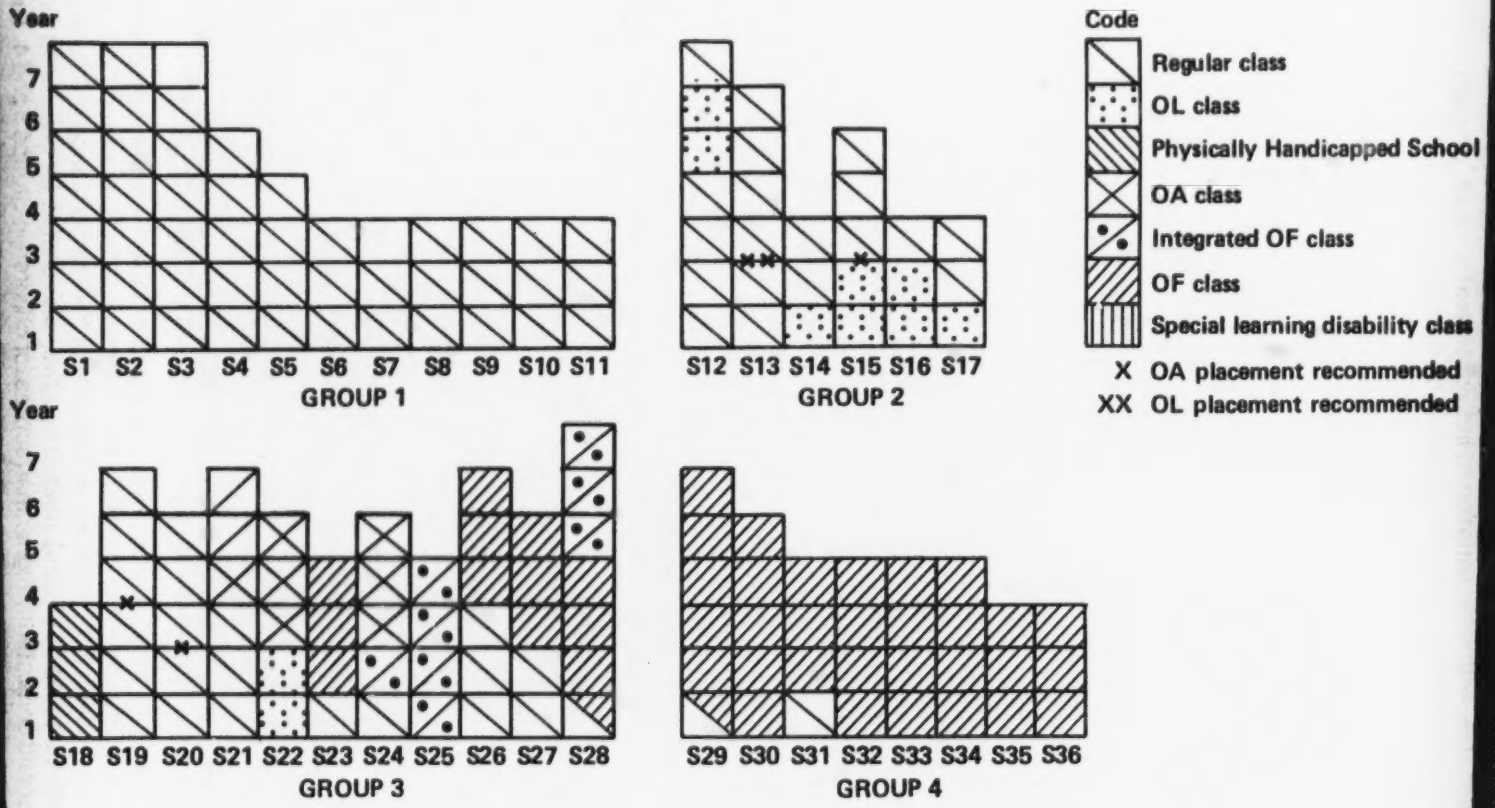
Thirty six children (24 boys and 12 girls) were enrolled in the early language class between 1979 and 1983. Summary test results set out in Table 1 demonstrate the continued level of delay in the children's receptive, but more particularly expressive language skills, at the time they left the program to enter the school system. Variations between mean receptive and expressive language abilities are evident in scores on the two language tests reported in Table 1. For example, while the mean chronological age of the children was 65 months (range 56 to 76 months), their mean receptive language age was 52 months on the RDLS and only 41 months on the SICD. It should be noted that, because some children obtained ceiling scores in their performance on the tests (5 on the RDLS and 7 on the SICD), these mean scores were probably depressed. However, the mean expressive language scores were lower, comprising 42 months on the RDLS (3 ceilinged) and 35 months on the SICD (4 ceilinged). The overall level of depression of the children's language skills was also evident on the criterion-referenced UPAS; at the final assessment, the group mean score was

Table 1 **Test scores of children enrolled in the Early Language class between 1979 and 1983**

	Group 1	2	3	4	Total
Number	11	6	11	8	36
boys:girls	8:3	4:2	6:5	6:2	24:12
Age (months)					
mean	65.4	61.8	67.4	65.2	65.2
S.D.	4.1	5.6	5.1	4.5	5.2
IQ					
mean	101.6(3)*	101.0(2)*	62.6(1)*	48.3(1)*	77.8(7)*
S.D.	14.1	14.2	24.4(1)***	12.4(2)***	26.0(3)***
PPVT					
mean	93.0(4)*	95.5(2)*	63.9(4)*	55.3(2)*	76.2(12)*
S.D.	10.0	7.2	14.8	20.3(2)***	22.5
Reynell: Compreh.					
mean	67.9(5)**	58.8	40.3(1)*	40.8(2)*	52.2(3)*
S.D.	15.2	8.2	10.9	3.6	17.4(5)**
Expression					
mean	56.4	58.3(2)**	31.7(1)*	26.6(2)*	43.9(3)*
S.D.	14.6	18.6	14.4	4.6	19.3(2)**
UPAS Communication					
mean	85.8	79.2	62.2	51.7	69.9
S.D.	12.6	9.8	18.3	14.1	19.9
SICD Receptive					
mean	45.3(5)*	46.0(3)**	37.3	36.8(5)*	41.3(10)*
S.D.	6.0(5)**	2.0	4.4	3.0	6.0(8)**
Expressive					
mean	42.7(5)*	40.7(1)**	28.7	29.6(5)*	35.3(10)*
S.D.	8.5	6.3	4.3	5.4	9.0(4)**
Language disability					
Delayed/disordered(1)	8	4	2	2	23
Delayed only	2	2	9	6	19

* (Number of cases missing)
** (Number of children with ceiling scores)
*** (Number of children who were unassessable)
(1) delayed: immaturity in language development disordered: deviant development, i.e. outside normal developmental patterns (Crystal, 1980, p.126)

Table 2 . School placement of children enrolled in the Early Language Class between 1979 and 1983



almost 70%, with wide variation in individual results which ranged from 26 to 98% (S.D. 20%). (A child developing normally would be expected to pass 100% of the items at the relevant age level).

A number of inconsistencies were present in the IQ test results reported in Table I, partly because such tests were not administered routinely in the program until 1981, but also because no single standardized test of intelligence was appropriate for use with a group of children whose developmental level and, more particularly, expressive language skills, varied widely. Data presented in Table 1 included results obtained from assessments carried out at the Centre, or, where no IQ test scores were collected, results reported from other sources (e.g. child health centre reports). Three children who were found to be unassessable on an intelligence test while at the Centre were given a nominal score of 30 for the calculation of a group mean score for both IQ and PPVT for this report. On the basis of these results, the mean IQ score for the 29 children for whom information was available was almost 78 (SD26), with scores ranging from 30 (the three children who were unassessable) to 125. The mean PPVT standard score of 76.2 (SD 22.5, range 30-104) for 24 children is consistent with this result.

3.2 Placement and progress at school

Information on the placement of the children at enrolment and in subsequent years is set out in Table 2. These results were organised in terms of the five special education service levels identified in Figure 1. However, since details were not collected on any support provided to individual children and their teachers in regular classes (Levels 1-3 in Figure 1), no distinction was made between these three situations in Table 2; children were only identified as being in a regular class, with no indication that additional services were provided. One other variation made to the Figure 1 model lay in a distinction drawn between children in a special class for the language disabled (OL) and children in other types of special class, such as those for the mildly (OA) and moderately intellectually handicapped (integrated OF). This distinction was made on two grounds: firstly, children in OL classes were expected to be within the normal intellectual range and secondly, placement in an OL class was usually short-term (1-2 years). In contrast, children in OA and integrated OF classes were mildly or moderately intellectually handicapped and their placement was likely to be long-term (more than 2 years).

When reports on the placement and progress of the children were examined, it became evident that the children could be divided into four distinct groups:

i. Children who remained within a regular class.

ii. Children who spent 1-2 years in an OL class.

iii. Children who remained in classes within the regular school system for at least a year and then moved into special classes or schools.

iv. Children who were enrolled directly into schools for the moderately intellectually handicapped (OF schools).

(a mildly intellectually handicapped boy with additional physical impairments, enrolled in a school for physically handicapped children, was included in Group 3).

Test results for the four groups were included in Table 1 and the school placement of the children was outlined in Table 2. When these results were examined, some patterns became evident. For example, on the basis of their performance on the RDLS and SICD, the groups could be roughly divided into two, with scores for children in Groups 1 and 2 similar and consistently higher than scores for children in Groups 3 and 4. The mean RDLS

Comprehension scores for Groups 1 and 2 were 68 and 59 months, with RDLS Expression scores 56 and 58 months respectively, compared with Groups 3 and 4 scores of 40 and 41 months for RDLS Comprehension and 32 and 27 months for RDLS Expression. Similarly, on the SICD Groups 1 and 2 gained consistently higher mean scores than Groups 3 and 4, with 45 and 46 months for receptive and 43 and 41 months for expressive skills, compared with 37 months (both groups) for receptive and 29 and 30 months for expressive skills in Groups 3 and 4. Finally, it should be noted that only four of the 16 children in Groups 1 and 2 were considered to be simply delayed, rather than both delayed *and* disordered, in their language development, in contrast with Groups 3 and, more particularly, 4, where the number of children with delayed language only was much higher.

In both IQ and PPVT scores, Groups 1 and 2 showed a similar pattern to that observed in the language test score; both groups had a mean score of 101 on tests of intellectual functioning, with lower mean standard scores on the PPVT (93 and 95 respectively). These results were consistently higher than the results obtained by Groups 3 and 4 on these measures. Apparently children in Groups 1 and 2 were able to perform more successfully on all the measures used than children in Groups 3 and 4 and overall were functioning within the normal range, though with some impairment in receptive, but more particularly expressive, language skills. Results from the UPAS confirm this pattern in the children's performance, with a consistent diminution in mean scores across the four groups, but with the greatest variation between Groups 2 (79.2%) and 3 (62.2%). The wide range of scores in Group 3, evident in the standard deviation of both UPAS (18.3) and IQ (24.4) mean scores, probably reflects the rather 'catch-all' nature of this group in relation to the other groups identified in the study.

A number of specific comments could be made in relation to the school placement of the four groups of children:

Group 1 Seven of the children in this group had language problems associated with difficulties in social and emotional areas; for example, S7, S8 and S9 were selectively mute when they joined the class, while S1, S4, S10 and S11 had difficulties in social relationships. The remaining four children (S2, S3, S5 and S6) were referred to the class because of difficulties in expressive language, though initial assessment showed that they were also delayed to some degree in receptive skills. It is interesting to note that of the three children who survived five years in regular classes, (S1 and S3) two were in non-government schools.

Group 2 Five of the six children in Group 2 attended or were offered a place in an OL class; S13 moved interstate prior to his enrolment and no information was available on his subsequent school placement, though it was assumed that he remained within the regular school system. S15 was recommended for placement in an OA class following two years in OL, but her parents chose to enrol her in a non-government school in preference to the special class. Her final test scores (e.g. 4.09 and 4.03 for RDLS comprehension and expression, with 84 and 85 for IQ and PPVT Standard Score respectively, suggested that she was functioning at the lower end of the intellectual range when compared with other children in this group. Her results can be compared with S22 who, having spent two years in an OL class was transferred to an OA class. This child was not included in Group 2, primarily because his test scores were generally lower than other children in the group; his final RDLS comprehension score was 52 months, with expression 36 months, an IQ score of 73 and PPVT Standard Score of 60 (his chronological age at this time was 68 months). This child had a very severe expressive language problem and it was difficult to determine the extent to which his poor performance on IQ tests reflected his inability to express himself verbally.

Group 3 As suggested in the previous discussion of S22, the progress at school of children in Group 3 shows a more confused pattern than the other groups. Two children (S19 and S20) were both recommended for OA placement following 2-3 years at

school. In both cases the parents refused the offer. One child moved to another school and was reported to be progressing well in her school work; the other child, given extra help within her regular class for a year, also progressed satisfactorily, but there was no guarantee of further assistance when the child moved into the primary department of the school. S21 had bizarre behaviour and disturbed, rather than delayed, language. She received extensive support from an itinerant teacher of the behaviourally disturbed during her first year at school, but was subsequently moved to an OA class. Five of the children also spent periods of time varying from six months (S28) to three years (S26) in a regular class before being moved to OF schools (S23, S26, S27 and S28) or classes (S24). Subsequently, S28 was placed in an integrated OF class and S24 went to an OA class. In fact, of the 11 children in this group, only two remained in the school in which they were initially enrolled; S18, who was in a school for the physically handicapped and S25, who attended an OF class in a rural area.

Group 4 Only one of the eight children in Group 4 (S29) spent any time in the regular school system. He had initially been enrolled in a Department of Education preschool and was subsequently enrolled in a kindergarten class at the same school. However, as a result of inappropriate behaviour and a generally low level of functioning, he was moved to an OF school after about one term. The other seven children went directly to OF schools; six (S30, S31, S32, S33, S34, S35 and S36) were functioning at a mild to moderately intellectually handicapped level at the time they left the Centre, with associated behaviour patterns that caused problems when they were placed in relatively unstructured situations with large groups of children. S34 had a severe expressive language disability that undoubtedly would have limited his ability to cope in a regular class.

In considering the information presented here, some general comments could be made. For example, it was difficult to see marked differences between the children in Groups I and 2 in the test data presented in Table 1, apart from the discrepancy already noted in UPAS scores. It was disappointing that information had not been collected on the type of support (levels 1-3 in Figure 1) that was provided to help maintain Group 1 children in regular classes. It would be interesting to monitor the subsequent progress of children in these two groups, particularly in relation to those who spent some time in an OL class. The fact that two children in Group 2 who completed two years in an OL class and were later recommended for OA placement suggested that this class may have had an assessment, as well as a remedial function for some children.

One of the most striking features of the reports on the children in Groups 3 and 4 was the number of changes experienced by Group 3 in their class placement during the early, critical years at school. In contrast, Group 4 in general remained at the same school following enrolment. It is anomalous that in Group 3, three children who were clearly at high risk for experiencing serious difficulties, were required to adjust to marked changes in environment during their early years at school. On the other hand, these children did have a chance to experience schooling in a fully integrated situation, in contrast with their Group 4 peers who were largely denied this chance.

4. Discussion

Two major issues arise from the information presented in the previous section of this report: both concern the school placement of a group of children who were known at the time of their enrolment in school to have disabilities or impairments,
particularly in the area of language, that were risk factors. One involves the possibility that school can itself be a disabling experience for some children, while the second relates to the integration and maintenance of children with special learning needs in regular schools.

1. Of the four groups of children identified in the study, two had relatively stable school placements: Group 1 remained in regular classes, while Group 4, apart from one child who spent a term in a regular kindergarten class, were enrolled and remained in (OF) schools for the moderately retarded. The children in the other two groups had a more varied pattern at school. Children with language disabilities could be admitted to a special (OL) class at Infants or Primary levels in New South Wales schools and in fact four of the six children in Group 2 were considered to fall into this category and were placed in an OL class at the time of their enrolment at school, following an earlier referral by a speech pathologist and/or Special Education Centre staff. These children were therefore given special assistance during their first, critical years at school and were subsequently returned to a regular class at a time determined by a review committee.

A very different picture, involving marked changes in school placement, was evident in reports on the children in Group 3. While they had also been identified at an early age as being at risk for school failure, and as a result had been enrolled in the early language class at the Special Education Centre, 8 of the 11 children in the group had been enrolled initially in a regular class. While all these children had problems in their language, they also had difficulties in other areas of learning and could have been considered likely to have learning difficulties that required remedial help; some were mildly intellectually disabled. In New South Wales there are no special classes or schools for children with learning difficulties (though children with severe reading difficulties can be enrolled in OP classes); provision is made for them within a regular class. Where the child's difficulties are such that the teacher needs supplementary support, an advisory and consultative service is provided by school inspectors, Special Education consultants, school counsellors, resource teachers and visiting teachers. (See Figure 1). Undoubtedly some support of this type must have been available for the teachers of the two children who remained within the regular school system, in spite of pressure to move them to OA classes. However, the support available was apparently not sufficient to enable six children in this group to remain in classes with their normal peers. The pattern of school placement reported for these children (e.g. to OF school, OF school then OF class, OF class then OA class, or straight to OA class) suggested that the children removed from a regular class were either placed 'wherever a space was available' or were 'tried out in various classes until an appropriate one was found'. Since such changes in schooling are known to have an unsettling and usually negative effect on children who are functioning at a normal level, they must have had a particularly undesirable effect on children who were known to have problems and to be at risk for failure at school. In this, it could be claimed that the school had probably functioned as a *disabling*, rather than as an enabling structure, for these children.

2. While support for the principle of normalization has had a profound influence on educational thinking and planning in many Westernized countries, the impact of these changes has been somewhat slower in the area of service delivery. For example, the cascade model (Deno, 1970) which provides the basis for special education provision in some Australian states, is inherently a separation model; it is built around the assumption that when children's needs are not satisfactorily met in classes at one level of the cascade, the child will move 'down' to a more separate level that is designed for more seriously disabled children. As an added complication to the cascade model currently operating in New South Wales, special classes and schools are provided for children within identifiable categories, including sensory impairments (deafness and blindness), language and reading difficulties, emotional disturbance, physical disability and intellectual disability (mild, moderate/severe/profound). It can be argued that the main focus of this model is to match the atypical learner to the services available. This may involve moving the child into a series

of different settings until a satisfactory 'fit' is found and certainly presents a problem for the child whose difficulties do not fall within a recognized category of special need.

As noted earlier, a quite different model was proposed in Victoria (Collins, 1984). This suggested that as children demonstrated that they were having problems, appropriate resources would be provided to support them within the regular classroom. Such resources would be made available by closing some special (i.e. non-integrated) classes and schools and re-locating their staff to work with children who had special learning needs within regular class settings. While this approach may be administratively problematical, particularly for some groups of children (e.g. the profoundly handicapped), it may provide a much more satisfactory service delivery model for children identified in this report, particularly those in Group 3, who in the main did not receive appropriate services within a regular class and as a result were moved around until the learning difficulties they presented matched the situation in which they were placed.

What factors are most critical for the maintenance of a child with special learning needs within a regular class and school? A number of variables, both within the child and the school environment, are relevant here, since eventually the provision of the most appropriate educational services involves a careful match between the child's needs and the resources available within the school system. For example:

1. ***Within child variables:*** these could include, apart from physical, sensory, emotional, behavioural and intellectual characteristics, factors such as the child's self-esteem, motivation to learn, distractability and ability to comply with classroom management procedures.
2. ***Environmental variables:*** these could include factors associated with ***the teacher***, such as his or her attitude to children with special educational needs, experience with such children, and any specialist training that has been received. Factors associated with ***the classroom*** could include the number of children with special needs in the class, the teaching materials and resources available and the physical layout.
3. ***Other variables*** that could have an impact on the child include the ***level of support***, both moral and practical, available within the school from the principal and other teachers; the level of expertise available from resource or other specialist teachers and counsellors; ***home factors***, such as the ability of the child's parents and family to provide back-up assistance and support; and the level of ***other assistance available*** from groups closely associated with the child's care, including medical practitioners, therapists, counsellors or other community members.

Clearly there are a number of factors that will influence the progress of children with learning problems within the school system. However probably the most important concerns the delivery of effective services. This is dependent on a number of factors including appropriate pre-service and in-service training of teachers, the development of effective teaching technologies and provision of properly trained personnel to assist teachers in regular classrooms. Such services should help teachers to develop relevant competencies so that they are able to provide the specialized learning experiences that are needed by many children, at some time in their schooling

CONCLUSION

As a result of earlier developments in the field of special education (see Chapter 2), most educational systems have evolved a cascade of service delivery alternatives, including specialist assistance for teachers in regular classrooms, full or partial special class placement and special schools, which are intended to provide appropriate educational placements for children with special learning needs. In utilizing these services, efforts are

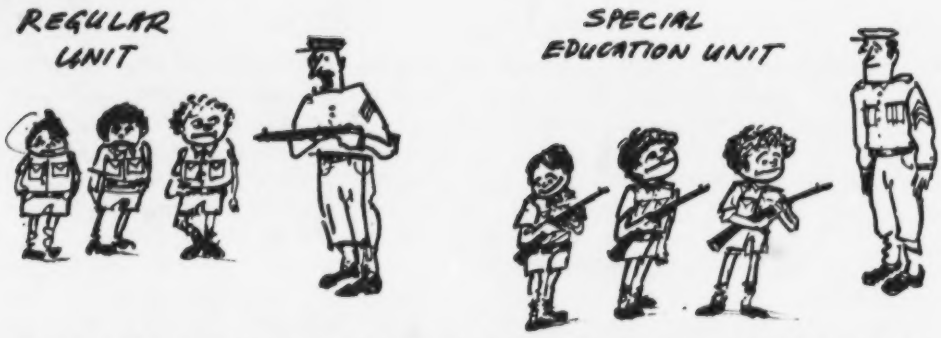
made to match the needs of particular children with the services that are available. However, as a result of changing patterns of need (e.g. an epidemic of german measles can result in an increase five years later, in the number of deaf, blind and multiply handicapped children requiring special education) and changing patterns of demand (e.g. growing community acceptance of the principles of normalization), can result in a search to find children with specific disabilities to fill empty places in long established, but now perhaps redundant, services.

In 1968, Lloyd Dunn questioned the need for special class placement for children who were socio-culturally deprived, slow learning or mildly retarded (Dunn, 1968). He queried the validity of such placements, using arguments based on the negative effects of homogeneous grouping and labelling, together with the lack of evidence of the efficacy of special classes. Data presented in this chapter provide a further reason to question continued use of the cascade model, particularly for children with less severe forms of disability, whose learning needs do not always match any one of the specialized services provided within an educational system. As suggested by Dunn, special education should not be seen by teachers as a means of moving children who are failing *out* of regular grades. Instead, every effort should be made to develop resources to meet the needs of these children within the regular school system. Further, such help should be given at as early an age as possible, rather than waiting until the children fail and then attempting to match them to one of the places available in an established special education setting. Thorley (1976a) stated in a keynote address to the A.C.L.D. International Conference in Seattle:

> 'One of the standard defining criteria for learning disability is failure to benefit from the *normal* methods of instruction. This criterion implies that the size of the learning disabilities population will be related to the quality of instruction in regular schools' (p.2).

So when children like those who are the subject of this report begin to maintain their positions within regular classrooms, while achieving acceptable levels of proficiency in basic skills and other subject areas, it may be claimed that the educational system is effective, and that the goal of 'zero failure', described by Thorley in 1976, has finally been reached.

Chapter 7



CHARACTERISTICS OF REGULAR PRIMARY SCHOOL CHILDREN ENROLLED IN A SPECIAL EDUCATION UNIT

Bryce Cooper
Sandra Bochner

INTRODUCTION

Since the 1930's there has been growing awareness of the existence of a group of children within the regular education system who have problems in learning at a rate equivalent to that achieved by their peers. One of the early explanations for the difficulties encountered by these otherwise normal children was derived from the work of two refugees from Nazi Germany, Alfred Strauss and Heins Werner, who worked together at Wayne County Training School, Michigan, studying the impact of brain damage on children's development. This research was derived in part from Itard and Seguin's work with mentally retarded children, and was influenced by Goldstein, a neurologist who, as a result of experiences with brain-damaged veterans from World War I, proposed that injury to the brain, particularly the frontal lobes, resulted in marked changes in personality, perception and behaviour. By the 1960's, terms such as minimal brain damage and minimal cerebral dysfunction were being used to describe children who failed to progress as expected at school. These labels demonstrated the continuing influence of the 'Strauss Syndrome' model that conceptualized learning problems as 'soft signs' of brain damage (Strauss & Lehtinen, 1947).

Difficulties in verifying the existence of a link between children's difficulties in learning at school and brain damage resulted in a move away from the use of terms that implied brain impairment or dysfunction to describe these children. When the first parent-based organisation, The Association for Children with Learning Disabilities (ACLD) was formed in the U.S.A. in 1963, Professor Sam Kirk, in a now famous address, had just proposed that the term 'learning disabled' would provide a more useful label to identify children who were not demonstrably brain injured, but who had recognizable problems in learning that did not result primarily from sensory or motor handicaps, mental retardation, emotional disturbance or environmental deprivation. However, problems in reliably identifying children whom Kirk described as 'learning disabled' have continued to pose difficulties for educators (Kavale & Nye, 1985-6). Within the U.S.A., this problem is critical, since, in many states, access to the specialized services provided for children with learning disabilities is contingent on identification and diagnosis by a formal case-study evaluation, involving

extensive psychological testing. Children who need such specialized services are usually identified initially by classroom teachers and there have been problems in ensuring that such students are, in fact, recognized and referred for assessment (Pugach, 1985).

In Australia, the debate about children who experience difficulties in learning within the regular school system flared in the early seventies. An Australian Association for Children with Learning Difficulties (initially called Association for Children with Aphasic and Perceptual Problems was formed and lobbied the government for action. As a result, Federal Government in October, 1974, appointed a Senate Select Committee to inquire into specific learning difficulties. The subject of this inquiry was that group of children and adults who fail to achieve 'minimum acceptable standards' or levels of achievement that 'enable the individual to compete in society in such a way that he can, with reasonable effort, obtain for himself reasonable livelihood, dignity, and reasonable social intercourse.' (Mathews, 1976, Foreword). In introducing the Committee's Report, it was suggested that the incidence of children in schools who could be classified as failing to achieve minimal acceptable standards, despite normal intelligence, could be 'as high as 15-20 per cent' (Mathews, 1976, p.2). One recommendation of the Committee was that information should be collected at regular intervals on the incidence of students with learning difficulties enrolled in regular schools in Australia. This task was subsequently included in a request from the Schools Commission to the Fred and Eleanor Schonell Educational Research Centre in May 1978, to conduct a survey into special education provisions, needs and priorities in Australia (Andrews, Elkins, Berry & Burge, 1979).

The debate flared again in 1986 in N.S.W. when the encumbent Minister for Education attacked the proposition that about one in five children qualify for special education. 'The accurate figure, Mr. Cavalier says, is one in a hundred children suffering from a disability that requires specific, additional help.' (Sydney Morning Herald Editorial, February 24, 1986). Out of a total of 13 categories listed in an earlier report (*Strategies and Initiatives for Special Education in N.S.W.*; Doherty, 1982) the Minister identified seven categories of handicapped children whom he considered to be genuinely disabled. These seven categories comprised the high severity/low incidence group (see Bochner, this volume) who represent less than one percent of the population; i.e. children with serious organic disabilities, such as the physically handicapped and psychiatrically disordered. The other six categories identified in Doherty (1982) were not considered to be disabled by the Minister. Not unexpectedly, these included those children whose difficulties were mild in nature (low severity/high incidence), most of whom (11%) were classified as having 'learning problems'. This latter group represents the children enrolled in classes at the Special Education Centre, who are the subject of this discussion.

THE STUDY

The Special Education Centre at Macquarie University operates a number of research and intervention programs for children with special education needs. One of these involves two classrooms, located within a small private school on the University campus, which provide intensive remedial programs for children who have experienced severe learning problems in basic academic skill areas such as reading, spelling, handwriting and mathematics. Some children may also have serious behaviour problems, usually resulting from their learning difficulties. Each class caters for up to 10 children and is staffed by a master teacher and program assistant.

Between 1977 and 1984, 159 children were enrolled in these two classrooms—78 in the

infants class and 81 in the primary class. The children, who were referred by school counsellors from primary and infants schools in the Sydney metropolitan area, attended for four days a week over a period of about 12 months, returning to their home (referring) schools on one day a week. (For a fuller account of the classroom organization and operation see Bochner, Bracey, Ward & Outhred, 1980 and the Special Education Centre Booklets, 1979, 1984).

The purpose of this paper is to present the results of an analysis of background information collected on children enrolled in the Infants and Primary classes at the Special Education Centre between 1977 and 1984. Details were collected from initial referral forms completed by school counsellors in conjunction with children's school principals and teachers, at the time of referral to the Centre class. Information is presented under four broad headings: family background, physical/sensory problems, psycho-educational characteristics and schooling factors. Where appropriate, results are examined in terms of the two classes (Infants and Primary) in order to highlight differences that were observed between children in the two groups.

1. The Children

The mean chronological age of children in the Infants class at the time of entry was 7 years 10 months (SD 13 months), while in the Primary class it was 9 years 11 months (SD 10 months). At the Infants level, children were usually not identified as experiencing difficulties in school work until they had been in attendance for at least a year. A period of some months then elapsed during which a referral was made to the class, and if a child was accepted, a further delay often occurred before a place became available. Thus while the children's difficulties were often either predicted, at the time of school entry (Oberlaid & Levine, 1980) or became evident during their first year at school, there was a considerable delay between initial identification and enrolment in the Centre class. It should be noted that in fact some children identified as failing at the end of their first year at school later caught up, so this delay ensured that the problems of children entering the program were real, rather than the product of an initial developmental lag (Belmont & Belmont, 1980). A similar gap between identification and enrolment usually occurred with children in Primary grades who were often not referred to the Centre until they had been in a Primary class for at least a year. Again there was often a further delay between referral and enrolment at the Centre.

As may have been predicted from other studies (e.g. Andrews et al, 1979; Fogelman, 1983; Harness, Epstein & Gordon, 1984; Norman & Zigmond, 1980) the ratio of boys to girls in the two classes was almost 4:1. However, there was a higher proportion of boys in the Primary (85%) than in the Infants (74%) class.

2. Family Background

Most the children (87%) lived with both their natural parents, with a further 6% adopted or 3% in a foster situation. Almost all (94%) had siblings and were fairly evenly spread in terms of their position in the family (36% first and 39% last born). Most of the children came from middle class socio-economic backgrounds, probably reflecting the University's location in a middle class area of Sydney. Twenty five of the children (16%) had a non-English speaking background (11 and 14 from the Infants and Primary classes respectively). However, only 16 of the children spoke a second language and most (11) were in the Primary class.

3. Physical/Sensory Problems

Information concerning the rate of occurrence of physical or sensory problems (e.g. hearing, vision, speech) is presented in Table 1. It is interesting to note that the most frequently reported problem area was language; more than 40% of the children had difficulties in oral expression though the difficulties were considered to be mild in 3 out of 4 of the children involved. The majority (70%) of this group were in the Infants class, including all but one of the 15 children who had severe problems. This variation between the two classes may have been associated with the greater research interest in children with language problems in this class, resulting in preference being given to this group when selection of children occurred. It could also reflect an recognized association between problems in language acquisition and difficulties in the early stages of learning to read (see Fogelman, 1983; Fundudis, Kolvin & Garside, 1979; Rutter, Tizard & Whitmore, 1970; Silva, McGee & Williams, 1983).

TABLE 1 Distribution of Communication, Sensory and other Problems in Infants and Primary Class Children.

		No Information		No Problem		Mild Problem		Severe Problem	
Problem area	Class	f	%	f	%	f	%	f	%
Speech/ Language	Infants	6	7.7	30	38.5	28	35.9	14	17.9
	Primary	8	9.9	55	67.9	17	21.0	1	1.2
	Total	14	8.8	85	53.4	45	28.3	15	9.4
Vision	Infants	11	14.1	47	60.3	19	24.3	1	1.3
	Primary	10	12.3	46	56.8	24	29.6	1	1.2
	Total	21	13.2	93	58.5	43	27.0	2	1.3
Hearing	Infants	9	11.5	52	66.7	16	20.5	1	1.3
	Primary	9	11.1	61	75.3	11	13.6	0	—
	Total	18	11.3	113	71.1	27	17.0	1	0.6
Other	Infants	14	17.9	34	43.6	23	29.5	7	9.0
	Primary	18	22.2	51	63.0	12	14.8	0	—
	Total	32	20.1	85	53.5	35	22.0	7	4.4

Most of the children's problems in vision and hearing were mild in nature (one child in the Infants class had a moderate hearing loss in addition to other learning problems which prompted his referral to the class). Children with more serious disabilities in vision and hearing are usually identified at an early age and appropriate educational services (e.g. specialist itinerant teachers) are provided within the school system. In relation to problems in vision, these were reported in as many as one in four of the children, with the proportion slightly higher in the Primary class (29.6%) when compared with the Infants class (24.3%). This may have resulted from the more effective assessment of vision that was possible with an older child (e.g. one who recognized alphabetic letters and understood concepts like up/down), but may have also reflected the increasing level of visual acuity needed in later primary grades (e.g. to read the smaller print) and the blackboard.

The higher number of children with mild hearing problems in the Infants class (21.8%) compared with the Primary class (13.5%) was not unexpected; it is recognized that the rate of occurrence of middle ear infections diminishes with age. However, there was some evidence available from another source to suggest that the incidence of mild hearing problems was higher in the group of children enrolled at the Centre, compared with their peers

in regular schools. Since 1980, children at the Centre have been tested by audiologists from the National Acoustics Laboratory. About 30% of the testing results have indicated the presence of some type of middle ear problem, as compared with a 20% rate of occurrence of such problems among children without learning or other school related problems in the normal population (Dermody, 1985). Whilst this does not indicate a marked difference between the two groups, it appears that there may be some justification for audiological assessment of children experiencing difficulties in learning basic skills in the Infants and Primary grade levels.

Evidence of the close association between hearing difficulties and language development in younger children was in the number of children in the Infants class who were reported to have both hearing and language problems; of the 17 children who had hearing problems, 13 also had a language problem.

4. Psycho-Educational Characteristics

Intelligence test scores (usually WISC, WISC-R or Binet) were reported for 134 of the children and these results are summarized in Table 2. Where available, both performance and verbal scores are reported, in addition to full IQ scores. Some patterns are evident in these results. For example, on all three IQ measures (performance, verbal and full scale), mean scores reported for the Infants children were lower, with higher standard deviations, than scores for the Primary class. In both classes, however, mean performance scores were higher than mean verbal scores. Marked discrepancies between verbal and perfor-

TABLE 2 Mean, standard deviation and range of intelligence test scores obtained by children in the Infants and Primary classes.

Intelligence Test Score	Class		
	Primary	**Infants**	**Total Group**
Performance score			
Number of children	65	51	116
mean	100.2	95.0	97.9
Standard deviation	13.8	15.0	14.6
range	75-130	64-141	64-141
Verbal score			
number of children	64	49	113
mean	98.7	90.5	95.2
standard deviation	14.8	16.4	16.0
range	63-128	61-122	61-128
Full score			
number of children	72	62	134
mean	99.4	92.7	96.3
standard deviation	12.9	14.7	14.2
range	70-130	62-132	62-132
Verbal-performance discrepancy			
number of children	63	48	111
verbal greater than performance score (percentage)	17.5	12.5	15.3
performance greater than verbal score (percentage)	23.8	25.0	24.3

mance scores have often been discussed as possible indicators of learning problems (e.g. Silva et al., 1983). In this study a discrepancy between scores of fifteen points or more (one standard deviation) was considered to be significant. Of the 111 children in the sample for whom both verbal and performance scores were available, almost 40% had a discrepancy between performance and verbal scores of more than 15 points, with the larger proportion of these children (24%) having performance scores higher than verbal scores. As would be expected, this pattern was most marked in the Infants class which had the higher proportion of children with language difficulties.

5. Schooling Factors

Information was sought on a number of aspects of schooling that are sometimes considered to affect children's progress at school. This included details of the child's pattern of attendance at school (e.g. the average number of days a child was absent from school in a year, any grades repeated and the number of schools attended prior to enrolment in the referring school) and comments from the teacher about the child's rate of progress in basic skills (reading, maths and other areas) and classroom behaviour (work habits, level of aggression, maturation). Several questions sought information about aspects of the parents' involvement in the child's education. Finally, from comments provided by both counsellors and teachers, each child's major area of difficulty (academic, behaviour, language and so on) was identified.

Since long or frequent absences and/or repeated changes in the school attended are widely regarded as contributing to the learning problems of at least some children (Galloway, 1976), information about school attendance was sought. However, repeated absences from school did not appear to have been a major factor contributing to the children's learning problems. Some children (8.1% in the Primary and 11.5% in the Infants class) were reported to have been away on average more than 20 days each year, but most children in both classes had fewer absent days. Repetition of a grade is often suggested for children struggling with school work, on two grounds: firstly, that they will have time to catch up, both developmentally and in academic skills; and secondly, as a remedial measure, by having an opportunity to learn the same skills over two consecutive years. Data showed that a number of children had repeated a grade (43.2% in the Primary and 39.8% in the Infants class), with Grade 1 the most frequently repeated in both groups (21.5% in Primary and 29.5% in Infants). Apparently, as suggested earlier, the children's learning problems often became apparent during their early years at school and repetition of Grade 1 was not unexpected.

More than a third of the children in the Primary class had attended at least one other school prior to their enrolment in the referring school; 14% had been at two or more other schools. Information on prior school enrolment was not reported for 17 of the Infants children, but of the remaining 61, 12 had been at another school, while 7 had been at more than one other school. It is not known the extent to which some of these changes in school placement resulted from parental dissatisfaction with factors associated with the child's problems at school or from other causes (e.g. changes in the family's place of residence).

Children are often first identified as having a learning problem at school as a result of their lack of progress in reading, particularly when their level of achievement is compared with that of their peers. It was therefore not unexpected that only 3% of the children were considered by their teachers to be at grade level in reading, while 21% were 6-12 months below and 73% more than 12 months below grade level. This pattern was consistent across both Infants and Primary classes. A similar pattern emerged for mathematics, in the Infants

class, with 23% of the children 6-12 months below and 72% more than 12 months below grade level. However, in the Primary class, while the proportion of children with maths problems was also very high, the level of severity of these problems was considered to be less serious, since 36% were rated as 6-12 months below and 54% as more than 12 months below grade level in this area. Other curriculum areas (handwriting, spelling, composition) were also poor, with 30% of the children rated as 6-12 months below and 65% as more than 12 months below grade level.

Since most children were referred to the program as a result of severe problems in reading, a standardized test of reading achievement was administered to all children, prior to their entry to the class. As a measure of their level of delay in comparison with their peers, the same test was also administered to four 'average-achieving' classmates who had been nominated by the teacher at the time the target child was assessed prior to entry. Results collected from assessment of the children and their average-achieving or home-school peers are set out in Table 3.

Table 3: Mean and standard deviation for two reading tests administered to children entering the Primary and Infants classes and to peers in their home school classes.

		Primary Grade Level			Infants Grade Level		
	Group	No. of children	Mean	S.D.	No. of children	Mean	S.D.
Chronological Age (mths)	Centre	81	119	10	78	94	13
	Home School	n.a.	—	—	—	—	—
Neale Analysis of Reading Ability (mths)							
Rate	Centre	61	96.9	12.7	—	—	—
	Home School	170	109.2	15.8	12	95.1	15.3
Accuracy	Centre	62	92.6	9.5	41	85.0	6.0
	Home School	170	108.7	11.9	120	98.1	11.1
Comprehension	Centre	62	96.8	17.9	38	82.8	5.4
	Home School	170	111.9	15.8	120	94.4	12.8
Daniels & Diack Standard Reading Tests							
Reading Age (mths)	Centre				12	64.7	4.9
	Home School				72	79.4	14.1
Not assessable	Centre only	3			21		
No results reported	Centre only	16			4		

Information from the Neale Analysis of Reading was available for 75% of the Primary class children and just over 50% of the Infants class. The Daniels and Diack Standard Test of Reading Skills was administered to a small number (15%) of the Infants group and these results are included in Table 3. A further 3 children in the Primary and 21 in the Infants classes were not assessable on a standardized test of reading at the time of enrolment.

No information was available on the chronological age of children in the home-school peer group, but since over 40% of the target children had repeated a grade, they were probably younger. The mean scores for the Primary class on the three measures included in the Neale Analysis ranged from 109 to 112 months, and it could be anticipated that the Primary

comparison children's mean age was also at about this level, or from 6-9 months below the mean chronological age of the target group. This age relationship is less clear in the Infants data, since the 21 children who were not assessable on either reading test may have been younger than those assessed on the Neale (where the comparison group scores ranged from 94-98 months) or the Daniels and Diack (where the comparison group mean score was 79 months).

On each of the three measures of the Neale Analysis, the target children in the Primary class scored at least 12 months behind their home school classmates and as much as 26 months behind the expected level for their chronological age. A similar pattern is evident in the Infants group, where the discrepancy, for those children who could be assessed on the Neale Analysis, was around 12 months, and on the Daniels and Diack, 14 months. It should be noted that these latter results did not include any component from the 21 children who had no measurable reading skills at the time of enrolment. Overall, these data demonstrate that the Centre children had significant delays in reading skills at the time of entry to the two classes.

For some children, lack of progress at school appears to have been related to poor work habits and lack of motivation to learn. Questions tapping these aspects of children's behaviour were answered by the teachers. Results showed that almost half of the children in both classes (45%) usually attended to set tasks and followed individual and group instructions successfully, with only 39% rated as acting in this manner *occasionally* and a further 11% *rarely*. A similar pattern was reported for classroom behaviours such as calling out, disturbing others and *out of seat*, with 46% rated as never displaying these behaviours and 37% acting in this way only occasionally; 13% frequently exhibited one or all of the behaviours listed. However. only 6% of the children were aggressive *often*, though 25% were *aggressive occasionally*. Unfortunately, comparable data were not collected from other children in the same class as the referred child, to show the level of these behaviours in peers who were not experiencing problems at school. Nor was any observational data collected to validate the accuracy of the teacher's judgement about the level of occurrence of the types of behaviour in the children entering the classes. However, evidence from other sources (e.g. Rutter et al., 1970) suggests that while children experiencing problems at school may demonstrate increased levels of poor or inappropriate behaviour in the classroom, these generally do not appear to have been a primary cause of the children's current problems for learning.

While the patterns reported for work habits and classroom behaviour were consistent across the two classes, there was minor variation on the level of motivation of children, with 18% of the Primary class rated as highly motivated by their classroom teachers, compared with 10% in the Infants class. However, a slightly higher proportion of the Primary class (38%) was also rated as having low motivation, compared with the proportion of children in the Infants class considered to have low motivation (33%). Apparently children in the Primary class were more likely to have extreme levels of motivation (very high or very low) than the younger Infants grade children.

Among the information collected from classroom teachers about children referred to the program, was a series of questions concerned with aspects of parents reactions to the learning problems experienced by their children and their role in overcoming these problems. Results obtained from the teachers' responses to these questions suggested that most of the parents (72%) considered their children's capacity to learn successfully at school to be only medium or low, compared with only 10% who viewed their child's capacity to be high. However, more than half (56%) showed a high level of interest in their child's schoolwork, and much of this interest was considered to be helpful (43%). Only 6% of

parents had a low level of interest in their child's work and 15% were considered to have a negative impact on the child's schoolwork. However, there was some variation in these trends across the two classrooms, with a higher percentage of parents in the Infants class considered to have a positive effect on children's progress (51%), compared with 36% in the Primary classroom, with a reverse pattern for negative effect (9% as compared with 19% for the Infants and Primary classes, respectively). This suggests that parents may be more successful in helping their children in the earlier school years than later, perhaps because, as the children mature, their problems become more entrenched and the demands made upon them for learning become increasingly complex. Whether parental attitudes and interest in fact affect children's progress at school could not be determined from these results. However, it has been suggested (e.g. Amerikaner & Omizo, 1984) that attention should be paid to aspects of learning disabled children's interaction with their families when individualized remedial programs are planned and implemented, since factors associated with these relationships could, at best, facilitate, or, at worst, actually impede, progress of the children at school.

Finally, based on the comments made by both counsellors and teachers about the reasons for each referral, the main reason cited for the referral of each child was classified in terms of eight broad categories, including academic, behaviour and language problems, delayed development, emotional difficulties, mental retardation, non-English speaking background and other reasons. As would be expected, *all* of the children had academic problems. Approximately one in three had behaviour problems and these children were almost equally represented in both Infants and Primary classes (33% and 27% respectively). Children with non-English speaking backgrounds (5%) were also evenly represented in both classes. However, four problem areas (language, delayed development, emotional difficulties and mental retardation) occurred more frequently in the Infants than in the Primary class (language: Infants 54%, Primary 11%; delayed development: Infants 18%, Primary 2%; emotional difficulties: Infants 36%, Primary 15%; mental retardation: Infants 6%, Primary none). This high level of variation in the presenting problems identified in children referred to the Infants class may have resulted from the fact that, in New South Wales schools, children with mild or minimal impairments that may impede or interfere with learning are usually enrolled routinely in regular classes, with no special provision made until their problems in learning become obvious. Most of the supplementary services required by these children are only available after they reach 8 years of age or enter Primary school. As a result, for many of these children, the first years in school function as an initial screening period, enabling an assessment of their learning potential to be made and an appropriate placement planned, according to need, in a regular class, with or without support, or in a special class or school. In contrast, children in the Primary class, who generally had more specific problems that interfered with their learning in basic skills such as reading and mathematics, were often not identified until the discrepancy between their achievement levels and those of their average-achieving peers became marked.

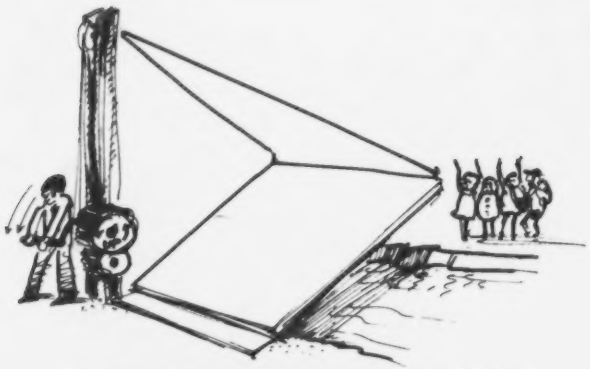
Overall, children referred to the Centre programs from Infants grades tended to have a number of different presenting problems, while children referred from Primary grades more frequently had specific problems in learning. However, of all the factors that were considered likely to contribute to the children's problems in learning, such as physical/sensory problems, home background, intelligence level and behaviour at school, no clear pattern emerged that could explain the children's difficulties. A number of the younger children had language problems, there was some evidence of middle ear problems and almost half of the children had a marked discrepancy between verbal and performance skills on an intelligence test. The one characteristic shared by all of the children was their difficulty in academic skills, particularly reading. This factor, alone, accounted for the initial referral of

all the children enrolled in the Special Education Centre Infants and Primary classes.

CONCLUSION

It may be claimed that whatever label is used to categorize children with learning problems, whether it be learning disabled, specific learning difficulties or some other label, their main characteristic remains their inability to learn successfully at school, with the degree of their academic retardation relative to their peers, the chief evidence of their disability. The continuing debate about the nature of children's learning disabilities, including problems in definition, identification and effective treatment, suggests that this group of children will remain, at least in the immediate future, a challenge for teachers in regular classrooms. With the provision of appropriate and effective learning conditions, their problems may never become apparent. However, where inappropriate or inefficient instruction is provided, these children will not progress at a rate comparable to their peers and their learning difficulties will remain a continuing source of frustration, both for the teachers expected to remediate their problems as well as for the children themselves, and their families.

Chapter 8



WE ALL NEED A BRIDGING COURSE FIRST

ATTITUDES OF N.S.W. PRINCIPALS AND TEACHERS TO THE INTEGRATION OF DISABLED CHILDREN

Yola Center

Since the passage of Public Law 94-142 (The Education of All Handicapped Children Act, 1975) in the U.S.A. and the tabling of the Warnock Report (1978) in the U.K., concepts such as normalization, decategorization of handicap and integration into regular schools have become the cornerstones of special education policy in most developed countries. However, despite the advances that have been made in the last decade to acknowledge the civil rights of children, care must be taken to avoid equating progress in promoting integration with progress in promoting educational quality. Indeed, although there appears to be little dispute regarding the philosophical principles underlying the concept of integration, no such consensus exists about the effectiveness of its implementation (Center & Ward, 1984, Center, Ward, Parmenter & Nash, 1985; Gottlieb, 1981; Heller, 1983; Johnson, 1983). It must be stated that, at this stage in N.S.W., the goal of integration is not the total abolition of special classes and schools for children whose educational needs dramatically exceed the resources of the regular school. It is, rather, the extension of the regular school's ability to cater for those children whose disabilities are not so severe as to preclude their placement in a regular class if appropriate support services are provided. Throughout this chapter it is this latter concept which will be referred to as *mainstreaming*.

A successful mainstreaming policy depends more on not alienating teachers within the educational system than on winning their active cooperation. For this reason, integration is one of those rare policies where implementation strategies are crucial (Rice, 1985). In N.S.W., however, mainstreaming has often been effected in an ad hoc manner, without any systematic modification to a school's organisation by administrators or without due regard to teachers' instructional expertise by their principals. In many cases, a child labelled as handicapped is added to a class containing a heterogeneous group of children labelled as normal, under the care of a teacher whose principal competency is a sympathetic approach to disability (Center et al, 1985). It is also highly probable that the most effective resource provisions for that child may be neither systematically provided to the school nor permanently guaranteed. Teachers' anxieties have been further increased by special educators, who, by their insistence upon the need for new skills for mainstreamed atypical students, have exaggerated the qualitative differences between 'categorized' students

and those 'normal' students with difficulties who have always been placed in the mainstream. If any alienation towards the mainstreaming process has been aroused in N.S.W. practitioners, then the possible backlash that may have been generated should be investigated and documented.

Stainback, Stainback, Courtnage and Jaben (1985) in the U.S.A. have argued that if mainstreaming is to proceed despite growing apprehension about its implementation (Davis, 1980; Horne, 1983; Harasymiw & Horne, 1976), then responsibility for its success can no longer be placed on overworked classroom teachers. Sociological studies of teachers have underscored the endemic uncertainties of the profession with regard to student outcomes, which can only be exacerbated by the addition of atypical students (Campbell, 1975; Lortie, 1975). This overanxiety, to which teachers appear to be subjected by an unsupported policy of mainstreaming, may actually impede their pedagogical performance (Sinclair, 1974; Spielberger, 1972) to the extent that innovative teaching solutions will be replaced by more conservative procedures. Research on mainstreaming (Slavin, Leavey & Madden, 1984; Wang & Walberg, 1983) indicates that it is only effective when regular teachers, with proper training and appropriate resources, successfully adapt instructional practices to meet a wide range of student needs. If teachers lack both relevant expertise and skilled assistance, then the process of mainstreaming may actively restrict their range of competencies by lowering their self-esteem in regards to their instructional techniques. It is therefore important to establish whether teachers perceive children, labelled by administrators as atypical, less as an extension of the existing classroom heterogeneity than as a final strain on their pedagogical resources. Furthermore, as policies of mainstreaming continue to be implemented, it should be ascertained whether teachers feel that their skills are currently successfully extended and supplemented by resource staff and other within-school arrangements in order to effectively teach the diverse ability groups who are placed within their classrooms.

One possible means of exploring the current effectiveness of the mainstreaming process in N.S.W. is to examine the attitudes of both school principals and teachers to the integration of disabled students, since principals' attitudes may influence their enrolment policies while teachers' attitudes appear to reflect their confidence in teaching atypical pupils (Harasymiw & Horne, 1976). In order to undertake this attitudinal research, two questionnaires were prepared following initial interviews with selected school principals and teachers. These questionnaires were sent to every primary and secondary principal and to one randomly selected infants' and primary teacher in each N.S.W. government and non-government school. By analyzing both quantitative and qualitative responses from all respondents, information could be obtained about their attitudes towards:

1. mainstreaming in general
2. mainstreaming of individual children with specific disabling conditions defined in educational and behavioural terms
3. Current support services
4. essential skills needed by mainstreaming staff.

Variations in attitudes between principals and teachers and among sub-groups of practitioners could also be investigated.

The final effective sample contained 1503 principals, including 548 from primary schools and 2219 teachers from infants' and primary schools. N.S.W. government, Catholic systemic and independent schools were represented in approximately the same proportions that exist in the population. Full details of methodology and data analyses are presented in Center et al (1985) and Center and Ward (in press).

1. Principals' and Teachers' Attitudes towards Mainstreaming

An analysis of information from the two surveys indicates that an overwhelming majority of principals (83%) and teachers (77.6%) are in agreement with the *general concept of mainstreaming* although primary teachers seem to be significantly less tolerant of the concept than are principals in regular primary schools. However, there does appear to be unanimity from both groups of practitioners in regards to the conditions which must operate for the effective integration of pupils with disabilities. Despite a strong philosophic commitment, they each place heavy emphasis on the provision of adequate support services if the policy is to be implemented with success. Teachers stress that their lack of specialized qualifications, the absence of appropriate resources and the curtailment of inservice courses impede their effective maintenance of atypical children in a large regular classroom. Principals, on the other hand, express significant doubt about the probability of appropriate support services being readily supplied to assist regular teachers. Thus, for both principals and teachers, the effectiveness of a mainstreaming policy is contingent only upon the establishment of a strong continuing support structure within the regular school system.

Sub-group variations for principals and teachers on the concept of mainstreaming

Although principals and teachers, as a group, display positive attitudes towards the concept of mainstreaming provided adequate resources are supplied, significant differences still emerge amongst *sub-groups* of both practitioners (see Table 1.1 and 1.2). For example, it appears that principals and teachers working in *Catholic systemic schools* are more favourable to the concept of mainstreaming than their counterparts in *government schools*.

Table 1.1 Significant differences among sub-groups of principals on the concept of integration

Principals	N	Mean	S.D.	Sig. Level
All principals	1465	1.92	.87	
in Catholic schools	225	1.63	.62	.01
in government schools	1167	1.97	.90	
with spec. educ. quals.	209	1.78	.86	.01
without spec. educ. quals.	1247	1.93	.86	
in country schools	677	1.88	.85	.05
in metropolitan schools	788	1.94	.89	
in primary schools	1026	1.89	.87	.05
in high schools	287	1.99	.87	

Table 1.2 Significant differences amongst sub-groups of teachers on the concept of mainstreaming

Regular teachers	N	Mean	s.d.	Sig. Level
All teachers	2219	2.05*	.94	
from Catholic schools	523	1.73	.70	.01
from Government schools	1501	2.19	.90	
with in-service training	459	1.85	.86	.01
without in-service training	1647	2.11	.95	
with pre-service training	645	1.93	.90	.01
without pre-service training	1430	2.11	.95	
within-school modifications for mainstreaming	1270	2.00	.94	.01
no modifications	791	2.15	.93	
itinerant teacher at school	747	2.00	.93	.05
no itinerant teacher	1312	2.01	.94	
female	1576	2.02	.91	.05
male	575	2.14	.99	.05

*A rating of 1 indicates strong agreement with mainstreaming whilst a rating of 5 indicates strong disagreement. Thus lower scores are associated with more favourable attitudes.

Such an outcome may be associated with the greater degree of pastoral care traditionally extended in Catholic systemic schools and/or with the support structures recently established for teachers with disabled students in regular classes. It may also be related to the extreme diversity of pupil abilities and behaviour found in the government system which has tended to become the repository for deviant students not accepted by the other two sectors. Teachers from government schools may be expressing their negative reactions to an already stressful classroom situation which is being recognised, to some extent at least, by their principals.

From the results it is also apparent that *special education qualifications* from pre-service or in-service courses are instrumental in lowering resistance to mainstreaming for both principals and teachers across all educational systems. This is an important consideration for the implementation of successful integration policies and has also been reported in overseas studies (DeLeo, 1976; Mandell & Strain, 1978).

Another significant variable that emerges from the breakdown of results is the greater tolerance expressed by teachers whose principals have instituted some *within-school modifications* to cater for atypical students (e.g. provision of aides or parents as assistants in the regular classroom, smaller class sizes, individualized programs, etc.). Apparently integration procedures will be seen as more effective when principals can adopt flexible organisational procedures to alleviate their teachers' workload. This outcome parallels the results of U.S. studies (Hartnett, 1979; Larrivee & Cook, 1979) which suggested that principals' awareness of teacher anxieties about mainstreaming was associated with more successful implementation of the policy.

2. Primary Principals' and Teachers' Attitudes towards Individual Disabilities

Primary principals and teachers were also asked to express their opinions about mainstreaming *individual children* with an extensive range of disabling conditions bearing in mind the level and type of support services that are currently available. All means and standard deviations for the listed educational and/or behavioural disabilities were calculated and are presented in descending order of acceptability (see Tables 2.1 and 2.2). An examination of these results indicates that primary principals and teachers are *not strongly positive* about integrating any exceptional children. Indeed, Horne (1983) reported that a sizeable minority of teachers even felt gifted children were difficult to manage in the classroom. However, by developing an arbitrary cut-off point for the various degrees of acceptability (see Tables 2.1 and 2.2) it is possible to isolate those disabling characteristics in children for whom integration is considered a positive, uncertain or negative option.

Table 2.1 Primary Principals' Attitudes towards Mainstreaming of Disabled Children

Attitude	Characteristics	Mean	S.D.
STRONGLY POSITIVE	Nil	(1.00-1.44)	—
POSITIVE		(1.45-2.44)	
	mild mobility difficulties	1.74	.71
	moderate mobility difficulties (school has access)	1.82	.80
	mild hearing loss	1.97	.62
	withdrawn	1.97	.70
	mild visual difficulties	2.14	.78
	needs adapted materials, e.g. typewriter	2.39	1.03
	short attention span	2.40	.85
	mild intellectual disability	2.40	1.02
	artificial bowel (parents will help)	2.42	1.00
	phonic school resistance	2.42	.94
UNCERTAIN		(2.45-3.44)	
	impaired language skills	2.45	.97
	moderate hearing difficulties	2.46	.97
	needs catheter (parents will help)	2.55	1.07
	needs medical monitoring	2.59	1.12
	moderate visual difficulties	2.61	1.03
	hyperactive	2.73	1.01
	asocial	2.90	1.01
	deficient in self-help skills	3.16	1.15
	needs intensive individual instruction	3.18	1.13
	aneuretic	3.26	1.11
	cannot recognize dangerous situations	3.30	1.05
	moderate mobility diff.(access unsuit.)	3.35	1.01
	aggressive	3.36	1.01
	blind	3.40	1.11
NEGATIVE		(3.45-4.44)	
	incontinent	3.45	1.01
	moderate intellectual disability	3.46	1.09
	profound hearing loss	3.46	1.01
	multihandicapped	3.69	.99
	catheter (parents will not help)	3.80	.97
	artificial bowel (parents will not help)	3.82	.95

Table 2.2 Regular Teachers' Attitudes towards Mainstreaming of Disabled Children

Attitudes	Characteristics	Mean	S.D.
STRONGLY POSITIVE	Nil	(1.00-1.44)	
POSITIVE		(1.45-2.44)	
	mild mobility difficulties	1.85	.76
	moderate mobility difficulties (school access unsuitable)	1.95	.83
	mild hearing loss	2.02	.65
	withdrawn	2.20	.81
	mild visual disability	2.21	.83
	artificial bowel (parents will assist)	2.37	.97
	needs adapted materials, e.g. typewriter	2.40	.96
UNCERTAIN		(2.45.3.44)	
	needs medical monitoring	2.50	1.1
	short attention span	2.51	.9
	impaired language skills	2.55	.98
	needs catheter (parents will assist)	2.55	1.03
	mild intellectual disability	2.60	1.04
	moderate hearing loss	2.64	.98
	phobic school resistance	2.70	.97
	moderate visual disability	2.72	1.03
	hyperactive	2.84	1.1
	asocial	2.94	1.02
	eneuretic	3.31	1.1
	deficient in self-help skills	3.32	1.1
	cannot recognize dangerous situations	3.36	1.01
	needs intensive individual instruction	3.44	1.1
NEGATIVE		(3.45-4.44)	
	blind	3.47	1.05
	aggressive	3.48	1.05
	incontinent	3.81	1.08
	moderate intellectual disability	3.52	1.04
	moderate mobility difficulties (unsuitable access)	3.62	1.02
	profound hearing loss	3.62	1.03
	artificial bowel (no help)	3.84	.91
	catheter (no help)	3.88	1.04
	multihandicapped	3.94	.91

Principals and teachers express *positive* mainstreaming attitudes only when they feel *no additional teaching competencies* or *extra-curricular duties* (e.g. toiletting, medical monitoring) will be required on the part of the classroom teacher. Thus children with *mild-moderate* degrees of physical disability are considered as suitable for placement in regular classes if the school is easily accessible, if parental help is provided or if adapted instructional materials are available. It is also interesting to note that teaching children with *mild sensory disabilities* does not appear to cause anxiety for teachers, possibly because of the confidence generated by the deployment of itinerant teachers for the hearing and visually impaired. This view is reinforced by the earlier result, that teachers with access to itinerant support services are more tolerant of the concept of mainstreaming (see Table 1.2). However, whereas teachers do not include *mild intellectual disability* or its probable concomitant, short attention span, into their list of acceptable disabilities, principals appear to support the inclusion of this type of child into the regular classroom. It is possible that prin-

cipals are less aware than teachers of the pedagogical difficulties associated with slow learning or off-task children, or conversely, expect that their teaching staff possess the necessary instructional skills. An interesting study conducted in the U.S.A. by Thomas (1985) found that, if teachers feel incompetent about selecting appropriate teaching methods for intellectually disabled children and have little helpful contact with a resource/special education teacher, they will exhibit negative views about mainstreaming.

Within the *uncertain* category are placed all those children who are likely to demand *extra teacher competencies* for effective instruction (e.g. impaired language skills) or *extra teacher attention* (e.g. child needing catheterization, medical monitoring, etc.). Although children with a short-attention span, hyperactivity or individual instructional needs have always been found within the regular classroom, it appears that when they are *labelled* as handicapped, they will generate some anxiety in regards to their mainstreaming capability. This result provides an interesting comment on the process of labelling. Principals and teachers appear to recognize that, for children thus categorized, additional strategies and/or support are required which are currently neither possessed by nor supplied to regular teachers. At the same time, neither practitioner appears aware that teaching the wide diversity of abilities which has always been inherent in an unstreamed class requires a similar knowledge of current instructional practices. Finally, the placement of children with *moderate* sensory disabilities in this category also may reflect teachers' and principals' perceptions of the educational needs of these children as being beyond the support typically provided by the itinerant teacher of the hearing and visually impaired.

Teachers and principals *do not wish to consider regular class placement* for children with *profound* sensory disabilities, *multihandicapping* conditions or *moderate* degrees of emotional or intellectual impairment. These disabilities have traditionally been regarded as suitable only for special school/special class placement and attitudes towards them do not appear to have altered. Although children with moderate degrees of intellectual retardation have been successfully integrated into regular classes with appropriate support services (Parmenter & Nash, 1985; Pieterse & Center, 1984), teachers appear to feel that their lack of expertise and inadequate resource provision preclude effective mainstreaming of such children. The anxiety generated by integration even extends to the rejection of pupils with *physical disabilities* when no parental support is provided, although these children generally pose no educational or behavioural atypicality and are considered favourably when parental help is supplied.

These results are reinforced by a qualitative analysis of comments on the question of integrating individually disabled students. Teachers express their anxieties about mainstreaming all categories of disabled children in terms of their own lack of skills and available time for individualized instruction, while both principals and teachers are critical of the quality and quantity of support staff currently supplied to them.

In order to ascertain whether *extra resources* would modify principals' and teachers' attitudes to integration, all respondents were asked how many of their opinions they would change if they had access to a greater *number* or *frequency* of support services. Almost half the group indicated that their opinions would not change, suggesting that for a sizeable proportion of teachers and principals, more resources of the same type will not greatly modify their attitudes towards mainstreaming of disabled students. To probe this result further, the practitioners less likely to change their minds were compared with their more labile counterparts. Results suggest that it is generally the *less tolerant* principals and teachers who are more likely to change their ratings. Thus the provision of extra appropriate support personnel may alleviate some of the negative attitudes currently associated with mainstreaming.

In these surveys there has also been an attempt to compare the attitudes towards mainstreaming of ***principals*** who are largely responsible for enrolment of individual disabled children with ***teachers*** who have the responsibility for their instruction. The results indicate that there is a consistent trend for principals to adopt a ***more positive attitude*** towards the mainstreaming of individually disabled children. Furthermore, the results of a factor analysis using oblimin rotation also indicate that the differences in attitude between principals and teachers are ***quantitative*** rather than ***qualitative***. In summary, it appears that both groups tend to categorize disabilities according to the stress under which they are perceived to place teachers, but principals appear to be consistently less anxious than teachers about the mainstreaming difficulties presented by a significant number of disabling conditions.

It is interesting to compare this outcome with the results of similar U.S. studies conducted by Gage (1979) and Hartnett (1979) who indicated that principals should become more attuned to teacher anxiety regarding special education students. The results of the present study suggest that both principals and teachers should be represented on a team which considers disabled children for enrolment into regular schools. Furthermore it appears that a functional skill assessment of children with disabilities may constitute a more realistic predictor of integration potential than assignment to a discrete handicapping category. At this point, however, such cooperative decisions would probably restrict the integration process, since teacher anxieties about mainstreaming are unlikely to be reduced until their own skills are upgraded and the number and quality of resource personnel are increased.

Sub-Group Variations on the Question of Mainstreaming Individual Disabilities

As research (Davis, 1981; Mandell & Strain, 1978) has shown that positive attitudes on the part of principals and teachers are a critical factor in a successful mainstreaming program, it was considered important to examine any sub-group variation amongst practitioners or their schools which could modify attitudes to integration of individually disabled children.

a) Inter-school Characteristics

Various inter-school variables were examined to see whether they were associated in any way with attitudes towards integration. Only those variables which are considered of educational significance (i.e. which can alter principals' or teachers' attitudes from positive through uncertain to negative) are described here. Full statistics can be found in Center and Ward (in press) and Center et al (1985).

Results indicate that principals' and teachers' attitudes to integration of individual disabilities are more affected by the ***system in which they are employed*** than by any other inter-school variable. As would be expected from the earlier discussion of Table 1.1, practitioners in ***Catholic systemic and independent*** schools are more tolerant of mainstreaming children with the listed disabilities than those from ***government schools***. Furthermore, principals and teachers in ***country schools*** across all systems appear to be more tolerant of mainstreaming than those in ***metropolitan areas*** apart from those teachers working in Sydney Catholic schools. This first outcome could be explained by the fact that country schools have less access to special facilities and have thus always been prepared to integrate disabled students. As has been noted earlier, the reorganisation of services within the Catholic Archdiocese of Sydney to extend greater support to atypical students in regular classes may be associated with the latter finding.

b) Intra-school Characteristics

An examination of various *intra-school variables* which might modify practitioner attitudes to integration indicates that both principals and teachers are more tolerant of mainstreaming if there is *no special class or unit* attached to their schools. These results are consistent with overseas data (Jensen, 1979) which found that, amongst elementary teachers, the absence of a special class in the teachers' buildings was associated with more positive attitudes towards mainstreaming. The explanation for this does not appear to be that special units increase practitioners' awareness of disability and hence heighten negative attitudes (Center et al, 1985). It seems rather that when special units are departmentally provided, they are regarded as a better alternative for atypical students than regular classes. This explanation is reinforced by the finding that when *modifications other than special units* have been initiated by principals to accommodate atypical students, both principals and teachers are more positive about integrating all categories of disabled children. This outcome replicates U.S. data (Hartnett, 1979) which suggested that positive attitudes towards mainstreaming of individual disabled students could be fostered by administrators' awareness of teachers' concerns about mainstreaming. While Thomas' previously cited study (1985) did not find that special classes on site were significant predictors of teachers' attitudes to mainstreaming, it showed that a tradition of special classes, special schools in the area, limited opportunity for team-teaching and a negative attitude on the part of principals combined to produce an extremely negative set towards integration.

It is also interesting to note that for most disabling characteristics, the presence of a resource teacher does not increase overall confidence of either principals or teachers regarding mainstreaming. There is some confirmation for this finding in an earlier outcome that availability of a resource teacher was not a decisive variable in modifying attitudes towards mainstreaming in general (see Tables 1.1, 1.2). In addition, Horne (1983) found that teachers not only demonstrated a lack of confidence in their own ability to work with students with special needs, but also questioned the adequacy of the training of the resource teacher.

c) Intrinsic Characteristics of Principals and Teachers

From the perspective of teacher training policy, it was considered important to examine sub-groups of principals and teachers to see if any *characteristics intrinsic to practitioners* emerge which may positively modify overall attitudes to integration. The results indicate that the variable which discriminates to the greatest extent amongst both principals and teachers is the *number of years spent* in the teaching profession. Apparently those with the least teaching experience (0-2 years) are consistently more tolerant of mainstreaming individual disabled children than their more experienced colleagues. Mandell and Strain's (1978) results of their U.S. study substantiate the finding that number of years of teaching experience correlate negatively with positive attitudes to mainstreaming.

It also appears that providing teachers with *pre-service training* in their undergraduate courses and, to a lesser extent, with *in-service courses* relevant to special education, can modify their professional anxiety about mainstreaming a wide range of disabilities. *Special education qualifications* will also raise the level of tolerance of principals in relation to the placement of disabled children into regular classes. These results reinforce those from the previously cited study (Mandell & Strain, 1978) as well as a more recent U.S. one (Stephens & Braun, 1980) which found that the number of university courses on exceptional children as well as inservice programs were significant positive predictors of teachers' attitudes.

In summary, it appears that perception of teachers' ability to maintain a child successfully in the classroom is directly associated with acceptability for mainstreaming. However, principals appear to have a slightly more positive view of their teachers' capabilities than do the teachers themselves. Be that as it may, perceptions of both will be modified to a significant extent by characteristics inherent in the respondents themselves and in the schools in which they work. When enthusiastic caring principals and teachers possess special education qualifications, and when school and community resources can be effectively harnessed to assist teachers in the classroom, both tolerance towards mainstreaming and the effectiveness of its implementation are likely to be increased.

3. Teachers' and Principals' Attitudes towards Current Support Services

The surveys were also concerned to evaluate attitudes towards the support services that are currently available for effective mainstreaming of disabled children. As resources are generally allocated on the basis of disability categories, teachers and principals were requested to rate each support service within this framework (See Table 3).

Table 3 **Current Satisfaction Levels of Principals and Teachers towards Support Services Provided** (Reported to nearest Percentage)

Disability	School Counsellor		Specialist Counsellor		Resource Teacher		Itinerant Teacher	
	P	T	P	T	P	T	P	T
Intellectual	23	15			11	10		
Physical	30	20	20	3	11	8		
Sensory (hearing/vision)	32	19	24	6	12	8	11	7
Behavioural	21	10	25	3	10	6	2	2
Learning difficulty	18	10			8	5		
Mean % Satisfaction	25	15	23	4	10	7	7	5

The results indicate that the *school counsellor service* is considered the most satisfactory of all the support services systematically provided to schools. However, the mean satisfaction level (25% for principals and 15% for teachers) suggests that a *large majority of practitioners* are critical of the support for all categories of disabled children presently provided by the school counsellor. While a major portion of the dissatisfaction stems from either the unavailability or the paucity of the service, particularly from teachers in Catholic schools, (7.8% satisfaction rate), there is also considerable doubt cast on the efficacy of the school counsellor, notably in the government sector (12% ineffective rating). It is also instructive to note that the greatest dissatisfaction with the school counsellor is in the areas of *learning difficulties*, *behaviour disorders* and *intellectual disability*, the largest handicapping categories. As there are no specialist counsellors or itinerant teachers in the area of learning difficulties and intellectual handicap in the large government sector, it is the school counsellor who must provide the greatest degree of input to the class teacher faced with mainstreaming a child with disabilities of this type. It appears to be precisely this current lack of adequate support, and consequent anxiety about their own skills which are associated with teachers' negative attitudes towards mainstreaming. Whilst principals' satisfaction with the school counsellor is also relatively low, their greater appreciation of this support service compared with that of their teachers reinforces the more optimistic trend consistently identified in the attitudes of principals.

Great dissatisfaction, particularly amongst teachers, is also evident for the support currently provided by the *specialist counsellor of the physically, sensorily handicapped and behaviour disordered child* (See Table 3). There is no doubt that this dissatisfaction is largely associated with the current small deployment of officers in this position, as is evi-

dent from the large percentage of teachers who want the service introduced or extended (83.2%). It is particularly interesting to note that teachers from *government schools* for whom the service is systematically provided are significantly less satisfied with its provision (3.1%) than teachers from either *independent or Catholic* schools (6.4% and 4.5% respectively) where it is virtually unknown. The low ineffective rate (1.9%) across all groups of teachers suggests that, unlike school counsellors, the service, when extant, does meet the current need of teachers with regard to children within these disability categories. However, an alternative explanation could simply be that teachers' contact with specialist counsellors is too infrequent for them to be able to evaluate the service effectively. Although the satisfaction rate expressed by principals still remains unimpressive, they appear once again to significantly overestimate the specialist school counsellor's effectiveness as an assistive to the regular teacher.

The data also indicates that both principals' and teachers' satisfaction with the *resource/special education teacher* is extremely low. This is particularly alarming since it is the only support service which systematically provides direct assistance to teachers for their learning disabled students. Since the low levels of satisfaction are doubtless associated with the fact that only 50% of teachers have access to a school-based resource teacher, practitioners were compared on the basis of presence/absence of resource teachers within their schools. As anticipated, the breakdown of these results indicates significantly more satisfaction, across all disability groups, by both principals and teachers who have resource support. However, the figures (23% and 16% for principals and teachers, respectively) are still far too low for complacency about the effectiveness of resource/special education teachers with regard to the mainstreaming process.

The explanation for these ratings probably resides in the fact that resource teachers are appreciated when available, but that their services are still spread too thinly to be a major support to teachers. This is indicated not only by their low ineffective rating when ineffectiveness was being considered (3%, 1.7%) but also by the fact that when there is a special class on site (to which some atypical children have already been removed) significantly more satisfaction is expressed for the resource teacher by both groups of practitioners. In any event, if resource teachers are assisting teachers to improve their teaching skills and strategies, rather than assisting individual children, there should be much more satisfaction generated at least by those teachers who are exposed to them. However, a qualitative analysis of comments reveals that both principals and teachers are extremely doubtful about the current capacity of the resource teacher to be an effective support in the classroom, a view reinforced by the overseas studies of Horne (1983) and Mandell and Strain (1978).

As principals have expressed preferences for school-based resources (Center et al. 1985), it was felt important to assess attitudes towards *itinerant* teachers for those categories of disability for which they are systematically provided. The results presented (see Table 3) indicate that current satisfaction for the itinerant teacher is low, particularly with regard to *itinerant teachers of the behaviour disordered*. While this is largely based on their short supply, there does appear to be some implied criticism of the effectiveness of the itinerant teacher of the behaviour disordered, particularly in the government sector (6.1%). To some extent the presence of a resource teacher in the school significantly increases the satisfaction accorded to the itinerant teacher of the sensorily handicapped, which may be the result of a school-based resource bridging the gap between the overworked classroom teacher and the over-scheduled itinerant teacher. In any case, the results do suggest that the whole question of the effectiveness of itinerant services, particularly in relation to behaviour disorders, remains a cogent area for further investigation.

Resources not systematically provided to teachers

Principals' and teachers' attitudes to services not systematically deployed to schools were also considered to be a relevant research question. An analysis of quantitative responses indicates that the support services which practitioners are keenest to introduce/increase are ***classroom aides, therapists for the physically handicapped*** and a ***decrease in class size*** whenever a disabled child is integrated. The majority of practitioners (68% and 75% for principals and teachers respectively) also view the ***itinerant teacher of the intellectually handicapped*** with approval, even for children labelled as having learning difficulties, suggesting that principals and teachers, particularly in the government sector, do not feel that resource teachers, on their own, are an adequate support for children whose academic skills are below grade average. It is interesting to observe that at least half the respondents are attracted by the idea of parental assistance in the classroom, particularly in the government and Catholic sectors. It therefore appears that both principals and teachers feel that the most desirable assistance for effective mainstreaming need not necessarily be the addition of more specialised consultant staff but extra support in the classroom for the regular teacher.

In summary it appears that there is general dissatisfaction with the current support services systematically deployed to principals and teachers in regular schools, in terms of both their quantity and their quality. Furthermore, it appears that practitioners are not necessarily seeking replication of current services but are seeking direct assistance for the regular teacher in the classroom, a view constantly reinforced by a qualitative analysis of comments. This section also substantiates the results of the two earlier ones which suggest that teachers regard labelled children as qualitatively different from their regular students, who can only be added to the classroom with both difficulty and disruption. Thus, although diversity in the classroom may be recognised by teachers, the integration of disabled children is seen less as an extension of this diversity than as an unfortunate graft, which in the absence of adequate training and resources, will certainly not 'take' effectively.

4. Teachers' Attitudes towards Essential Skills Needed by Mainstreaming Staff

Teachers' attitudes towards the skills they considered essential for a teacher in whose class a disabled child was mainstreamed were also examined. All means and standard deviations were calculated for the listed competencies and are presented in descending order of importance in Table 4.

From the competencies listed in Table 4, it appears that while teachers stress general competence they are still somewhat uncertain about the importance of a ***structured approach to curriculum objectives*** for effective mainstreaming. Most special educators would argue that the most efficient form of instruction, for probably the majority of students, is the adoption of structured teaching strategies. However, when comparing their ratings with those of principals, it does appear that teachers' views of essential skills are more realistic than those expressed by principals in relation to mildly handicapped students (Center et al, 1985). Principals feel that a sympathetic approach is the most essential skill whilst a structured approach is ranked as the least useful competency. This suggests that principals are still less aware than their teachers that those competencies required for the effective teaching of disabled children are those most necessary for the effective teaching of all children.

Table 4 **Teachers' attitudes towards skills required by a regular classroom teacher in a mainstreamed class.**

	Mean*	s.d.	
1. general competence	1.25	.49	
2. a knowledge of techniques specially designed for children with learning/ behaviour disabilities	1.39	.59	strongly agree (1.00-1.44)
3. a sympathetic approach to disabled children	1.40	.72	
4. the ability to work in classroom alongside trained resource teacher	1.49	.62	
5. sound basic knowledge of the psychological, social and physical characteristics of disabled children	1.52	.68	agree (1.45-2.44)
6. a structured, teacher directed approach to curriculum objectives	2.50	1.13	
7. an unstructured, child-directed approach to curriculum objectives	2.89	1.14	uncertain (2.45-3.44)

*Low figures indicate greatest approval

CONCLUSION

In summary, these two surveys have examined principals' and teachers' attitudes towards integration of disabled children to ascertain:

1) general attitudes to mainstreaming;
2) which disabled children are seen as successful mainstream candidiates;
3) whether both groups of practitioners feel that teachers have the skills, strategies and resource support to effectively mainstream disabled children;
4) if teachers feel that identified disabled children are a normal extension of the regular classroom diversity;
5) whether there are any significant differences in mainstreaming attitudes between teachers and principals and amongst sub-groups of both practitioners.

In general terms, the results on the current effectiveness of mainstreaming are less than reassuring. It appears that both groups of practitioners are only positive about integrating those disabled children who will require no extra competencies or time involvement on the part of teachers, i.e. those children, in fact, who have always been considered as regular classroom candidates. Furthermore, not only do teachers appear to feel that they lack the expertise to effectively integrate their disabled children, they also do not seem to have a great deal of confidence in the support services currently offered to them. In addition, they seem to regard labelled handicapped children as qualitatively different from other students, and in need of qualitatively different instructional techniques. Whereas principals' attitudes do not differ in kind from those of their staff, they consistently underes-

timate the anxiety that the policy of mainstreaming is arousing in their teachers. Consequently, they are not implementing the modifications to classroom organisation as often or as readily as staff needs dictate.

However, an examination of sub-group variations within both groups of respondents suggest that the future of mainstreaming need not be too bleak, if policies for lessening teacher anxieties are more actively pursued. Such policies must address the current training programs for all teaching staff in regular schools, with an increased emphasis on the instructional skills and strategies needed for handling diversity in the classroom. Teachers do not seem to be aware of efficient and diverse instructional approaches that are suitable for students who fail to profit in traditional classrooms. For example, active student involvement with learning tasks, guided practice sessions, the use of systematic error correction procedures and cooperative learning strategies are productive aspects of successful instruction that facilitates students' academic performance. Principals, too, need to be aware of those organizational procedures which will increase teacher confidence such as reducing class sizes, and recruiting volunteers, aides or peer tutors in the classroom. As special classes on site have been found to be negatively associated with tolerance towards mainstreaming, some restructuring of the special unit could be considered. It might be advantageous for the specialized teacher of the unit to supervise some reintegration of his/her students into the mainstream, acting as a resource for the regular teacher both for the special child and for other poorly achieving students in the regular class. This will reduce the hiatus between mainstream children and special children, decrease withdrawal time for atypical students and extend the regular teacher's skills. Once all practitioners realise that, by raising teacher competencies to accommodate disabled children in a classroom, the education of all children will be advantaged, then attitudes towards mainstreaming should become correspondingly more positive.

Chapter 9

TEACHER LANGUAGE—THE FORGOTTEN VARIABLE

Penny Price

Statement of purpose

The present study was a single case study of the language teaching practices and organization of one special education classroom with a population consisting of a teacher, a teacher's aide, and eight developmentally and language delayed children who displayed deficits in academic skills, and in some cases, disordered behaviour. The study was concerned with looking at current perspectives on theory and research in the area of language in the classroom. Data collected were analysed to provide information about the complexity and distribution of teacher and pupil utterances, and the pattern of strategies used by teachers in interaction with pupils. Differences between teaching contexts were also investigated. The results from such a study, which is purely descriptive, provide information about some aspects of language teaching and classroom organization which are important in terms of recently developed language intervention procedures, and in terms of current research which is attempting to clarify methods and procedures which are effective in teaching language to young developmentally delayed children.

In this paper the literature on language usage in the classroom is reviewed and contrasted with language used in the home in terms of its facilitating effect on early language acquisition. Results of this particular study are reported and suggestions made for improving the quality of interactions in the classroom from a language learning perspective.

Review of the literature

The acquisition of early language skills is widely recognised as one of the most difficult tasks facing young developmentally delayed children. Failure in this area leads to disruption of the interpersonal relationships within the family unit, distress, confusion and, frequently, loss of confidence on the part of the parents, and a reduced capacity to benefit from play groups, pre-school and school experiences on the part of the child. Over the last decade, the growing recognition of the importance of developing effective language and communication skills in all children has been matched by intense research activity in the area. There has been a movement away from the viewpoint that language can be usefully studied as a structural system, unrelated to language users and their environmental settings. A focus on the semantics of child language reflected the frustration experienced by

researchers and clinicians working with young children, and the inadequacy of syntactic analysis in describing the earliest intentions and meanings of children's utterances in the early stages of language acquisition. The development of semantic category systems (Bloom, 1973; Macdonald & Nickols, 1974) provided practitioners with a meaningful method of analysing pre-syntactic utterances of 1, 2 and 3 words in length. The most recent research emphasis has been in pragmatics, which emphasizes the purpose and functions of language usage, as opposed to its content and form.

Research in these areas has led to a recognition of the importance of the interactional nature of early language learning. Bruner (1973) emphasized the vital nature of the children's earliest relationships with their primary caregivers in developing the skills of joint action and joint attention which are pre-requisites for the development of later, more complex communication skills. Mahoney and Seely (1976) stressed the critical role of the key interacting adult in interpreting significant features of the environment to the child, and in providing the child with meaningful feedback to guide and encourage further communicative behaviour. Many studies have investigated the nature of the interactions between normal language learning children and their mothers in an attempt to determine what strategies are effective, but we have not reached the stage where definitive statements can be made about translating these findings into intervention strategies for language-delayed children (McConkey & Martin, 1984; McDonald & Pien, 1982; Olsen-Fulero, 1982; Snow, Perlmann & Nathan, 1985). Some of the findings indicate that mothers' speech to children in the pre-linguistic and early language learning stage is slower, with more pauses to mark the units of meaning, is semantically and syntactically less complex with shorter utterances, but increases with age to match the child's level. An excessive use of demands slows down the child's production of noun phrases, possibly because the imperative is useful in prompting children to act, but may be a very poor construction for teaching the child the relationship between lingustic structure and environmental events. This is in keeping with Mahoney and Seely's contention that the more a child talks, the more he learns (1976). Demands for *action* from the child may reduce the likelihood of verbalisation.

Recent research trends have had an impact upon the development of language programs and teaching strategies. Reliance on rigidly prescriptive programs which use a syntactic content base, behavioural methodology and are implemented in clinical settings (common in the early 1970's), has given way to more flexible and varied approaches in an attempt to overcome the major problem of lack of generalisation of language learned into the child's everyday language repertoire. The emphasis on semantic analysis in early stages of acquisition, and recognition of the importance of the children's interaction with both their physical and interpersonal environments has led to the development of program strategies implemented in natural settings, including pre-school, school or home, using significant adults such as parents or teacher as trainers, with language targets defined in semantic terms and selected on the basis of their relevance for each child. An approach which calls for the flexible application of intervention procedures in accordance with the needs of each individual child places a heavy burden on teachers and other relevant professionals working with developmentally delayed children, particularly when the role of the significant adult in interaction with the child is viewed as one of the critical factors in the dynamics of early language acquisition.

Traditional research into interaction in the classroom setting has not addressed these issues. Flanders (1970) was interested in analysing the teachers role and style along a dimension of warmth or directiveness. He ignored context. Bellack's (1967) system was developed for use in describing how lessons were structured and he showed the connec-

tion between teacher language strategies and the learning outcomes for pupils. In the U.K., Sinclair and Coulthard's (1975) work was concerned with categorising the different types of communicative 'acts' which take place in exchanges between teachers and pupils. They noted that the basic exchange in the classroom had a teacher-pupil-teacher format, where the teacher initiation was followed by pupil response, and this in turn was followed by a teacher-made evaluative remark. There were few pupil initiations. Barnes' (1969, 1976) work was broader in concept. He reported individual verbal exchanges of teachers and pupils, and was concerned with meaning as well as form or syntactic structure. He emphasized that language had a social as well as informational function, although language in the classroom was teacher dominated and pupil initiations were rare. The Bullock Report (1975) noted that teacher talk occupied 75% of classroom time. This reflects the traditional classroom lesson which is tightly structured with definite teacher goals, pre-conceived answers, and no room for hesitant or tentative offerings. Studies such as that of Cambourne (1971), who looked at a regular first-grade classroom in Australia, have indicated that the classroom is a poor environment for the acquisition and use of language skills by young children. Many children are excluded from participating because they do not understand the language of the lesson or cannot use language with confidence. If this is true for normally developing children, it is even more so for children who are developmentally delayed.

Findings such as those reported above prompted researchers to look closely at the differences between language used in the home and language used at school. Romaine (1984) identified the family, peers and school as the three most important settings for the development of discourse and communicative interaction. She stated that the crucial question was the extent to which school socialization and experience were discontinuous with respect to that of the home. Wells (1981) concluded from his study of language development in young pre-school children that conversation was the most important context for language development. Language in the home arises out of shared practical activity and is often child initiated whereas in the adult-structured, teacher-initiated school setting there is no assumption of shared knowledge, as there is in the home, and the contexts are often unfamiliar and the content abstract. Strategies for interpreting, using and learning language at home may be ineffective and unproductive at school, where the language usage is constrained by the need for 'order', and there is an excessive use of question-answer formats. Although some of the same forms are used at home and at school, such as the three part initiation-response-evaluation exchange, display questions and corrections, children at home have a wider range of conversational options. They have more right to initiate, to ask questions, to evaluate and even correct the adult response. They can introduce new topics and change the topic. There are a smaller number of participants and utterance types are more varied. The differences in interaction between the two settings are due to the differences in situation, purpose and participant groups. The pedagogic purpose is paramount at school whereas the purposes at home are more diffuse. The capacity to cope with the interactional style required in school is critical for success—language is a key factor in the causes of educational success and failure.

Slow learning and developmentally delayed children inevitably enter classroom situations while they are still in the process of acquiring basic communication skills. The social and interactive environment of the school then becomes of crucial importance in ensuring that growth in this area is facilitated. Yet this importance has not been reflected in classroom interaction research or in the literature relating to language acquisition in slow learning children. Beveridge (1981) reviewed a number of studies investigating the communication skills of severely delayed children in classroom settings and found that many child initiations were ignored and that teachers tended to encourage children who were easily

inhibited and to discourage others, suggesting that the control function was paramount. He also noted that slower children have trouble 'doing' and 'talking' at the same time, as has been noted with young normal children learning language. A special focus encouraging conversation skills is needed in order to develop these skills fully. This involves ensuring that there is time in the classroom routine for effective communication training and that the classroom becomes an environment in which children's communicative acts are responded to appropriately. Although some attempts have been made to disseminate practical applications developed from recent research findings in language acquisition and intervention, few studies have been reported that investigate the nature and quality of the communicative interaction between teachers and developmentally delayed or slow learning children (Leeming, Swann, Coupe and Mittler, 1979; McConkey, 1979).

The present study

This study was conducted in an infants class for language delayed children in a Special Education Unit. The class comprised a master teacher, an aide and eight children (seven boys and one girl) aged between 6 years 2 months and 8 years 6 months. The children had been referred to the class from local schools as a result of marked difficulties particularly in the area of expressive language. Two of the children were of normal intelligence; one had a severe expressive language problem and the other had been an elective mute since first entering school. The remaining six children had a range of developmental difficulties, in addition to their language problems. One was severely delayed, with autistic tendencies. The study was designed to investigate the following aspects of teacher-child interaction:

1. the distribution of utterances for teacher and individual pupils during the periods sampled.
2. teacher and pupil initiations and responses across different activity periods, e.g. academic, free play.
3. complexity of teacher and individual pupil utterances as measured by mean length of utterance (MLU).
4. analysis of verbal teaching strategies in interaction sequences.

Twelve hours of data were collected by means of recording teacher-child language interaction in twenty-four half hour sessions spread over a period of two weeks, using a microphone attached to the teacher. All utterances recorded during these sessions were analysed. These included utterances between the teacher and individual children, teacher and aide, as well as some instances of conversations between children. Utterances made by the teacher's aide were included in the analysis only when she was interacting with the teacher. For similar reasons pupil to pupil utterances were only coded when they occurred in the immediate vicinity of the teacher. The recording sessions were planned so that major aspects of the classroom program were evenly sampled. These included small group academic teaching, mixed group free and planned play activities and mixed group craft activities.

Results

1. **Quantitative analysis of the distribution of utterances within the classroom**

Table 1 Distribution of utterances by Speaker

Speaker	Total utterances %
Teacher	73.2
Pupils	23.4
Teacher's aide	3.4
	100.0
Teacher : pupil ratio	3:1

A total of 17,386 utterances were recorded during twelve hours of classroom activity. Data summarized in Table 1 indicate that three-quarters of these utterances were made by the teacher, providing a teacher-pupil ratio for utterances of 3:1. This ratio is similar to that posited by Flanders (1970), with his 'law of two thirds.' in which he stated that two thirds of the time spent in classrooms was devoted to talk, and two thirds of the talking was occupied by the teacher. No estimate of the time devoted to talk in the classroom was made in this study. On this measure the special class does not appear to differ greatly from classrooms for regular pupils.

Table 2 Distribution of teacher utterances by target listener

Target Listener	Teacher utterances %
whole group	6.5
small group	1.9
individual child	85.9
aide	5.2
self	.5
	100.0

As is evident in Table 2, the vast majority of the teacher's utterances (almost 86%) were addressed to individual children, rather than to either the class as a whole (6.5%), or to small groups of children within the class (1.9%). This is an interesting finding in view of the fact that most of the teaching activity in this classroom was on a small group basis, organised as far as possible on ability grouping. However, the small group teaching periods were obviously used for highly individualised teaching rather than group instruction. This is consistent with a finding by Conn and Richardson (1976), in a study of a special education classroom in England where one third of the text was addressed to the class as a whole, and two thirds was addressed to the children as individuals.

Table 3 Distribution of pupil utterances by type of utterance

Type of pupil utterances	*total utterances* %	*pupil utterances* %
initiations to teacher	6.3	27.2
response to teacher	10.5	45.0
reading, counting etc. in direct teaching sequence	5.5	23.2
to aide	.5	2.2
to other pupils	.6	2.4
	23.4	100.0

From the data presented in Table 3, it is evident that the ratio of *pupil initiations to teacher* compared to *pupil responses to teacher* was a little more than 1:2. This is the converse of teacher initiations and responses to pupil utterances (see Table 4), and so is not an unexpected result. One quarter of all pupil utterances were part of direct instructional sequences, where the utterance consisted solely of reading set words, counting or supplying mathematical answers, spelling, etc. Only utterances which had no additional (i.e. non-instructional) content were coded in this category. This finding, again, was not unexpected in view of the fact that twelve out of the twenty four sessions were devoted to basic skill acquisition. Pupil utterances to the teacher's aide, and pupil to pupil utterances were insigificant in number, and, as was explained earlier, were only coded if they occurred within the context of teacher interaction during one of the recorded sessions. They do not form part of the data considered for analysis in this study.

Table 4 **Distribution of utterances exchanged between the teacher and individual children**

Child's Name	*Utterances exchanged*	
	Teacher to pupil	*Pupil to teacher*
	%	%
Brendan	21.6	11.8
Simon	18.6	26.7
Philip	15.2	26.1
Jamie	15.2	13.2
Raymond	14.9	13.2
Bronwyn	7.8	2.2
Ricky	3.8	6.1
Patrick	2.9	0.3
	100.0	100.0

The data in Table 4 indicates that there was wide variation in the amount of text received by individual children, with a difference of 18.7% between Brendan who received the most (21.6%) and Patrick who received the least number of utterances (2.9%). However, the most marked feature of Table 4 is the wide difference in verbalisation rate between the most and least talkative children in the class. Two children, Simon and Philip, together accounted for more than half of the utterances directed to the teacher (52.8%), while not unexpectedly, less than 1% of the utterances were produced by Patrick, the boy who had the fewest number of teacher utterances.

The importance of the relative distribution of teacher and pupil talk lies in the implications for teaching the functions of language—ensuring that children acquire the initiating skills necessary to engage adults in conversation and to make their needs known. Teachers sensitivity to their own language patterns, both initiating and responding, is an issue frequently overlooked in the language teaching situation. In this classroom, the overall findings for pupil talk were vey consistent across children. Those who initiated at a high, moderate and low level were responded to in similar manner by the teacher.

The very high rate of teacher to pupil utterances addressed to Brendan were accounted for by the fact that he was a constant behaviour problem in the classroom, and thus received many controlling utterances that were not in any way related to his own verbal initiations. Patrick, who received the fewest teacher utterances, was autistic and spent a great deal of time engaged in isolating, self-stimulatory behaviours, which tended to be ignored, because the resources for providing one to one interaction with him on a constant basis were not available.

2. Quantitative analysis of distribution of utterances across session types

Table 5 Distribution of teacher utterances across session types

Session types	*Utterances*	
	Teacher %	*Pupil* %
Academic skills—Group 1	28.7	20.7
Academic skills—Group 2	26.7	17.6
Free play	24.8	35.4
Craft	19.8	26.3
	100.0	100.0

Academic skills Group 1 consisted of Jamie, Raymond, Simon and Patrick, with Philip, Brendan, Ricky and Bronwyn in Group 2. Group 1 was basically the younger children with Patrick included because of his very low level of functioning. These periods consisted of highly individualised instruction in academic skills. The number of children participating in free play sessions was variable as it was sometimes contingent upon having completed academic skill assignments. All the children participated in craft sessions.

From data presented in Table 5, it is evident that total teacher utterances varied very little across academic skill teaching to groups 1 and 2, and free play sessions, but fewer utterances occurred during craft activity periods, possibly due to the concentration on motor activity which the period required. Pupil talk was highest in free play sessions, markedly more pupil utterances taking place than in craft periods (35.4% to 26.3%) and least in academic skill teaching sessions to Groups 1 and 2. This finding is to be expected and reflects the teacher's intention of encouraging language skills during free play sessions, and, to a lesser extent, in craft periods, while academic teaching sessions were devoted to individualised teaching of basic skill activities.

3. Complexity of teacher and pupil language and teaching strategies

Table 6 Complexity of teacher and pupil utterances as measured by MLU

Pupil	*MLU*	*Teacher-to-child* %	*Discrepancy* %
Bronwyn	1.8	5.7	3.9
Raymond	1.3	4.9	3.6
Jamie	3.2	6.0	2.8
Brendan	3.9	6.6	2.7
Patrick	1.3	4.0	2.7
Philip	5.3	7.3	2.0
Ricky	4.8	6.7	1.9
Simon	4.8	5.9	1.1

The samples were taken from 200 teacher utterances and 100 pupil utterances taken during free play sessions.

There was a high degree of correspondence between teacher and child MLU, with discrepancies between *teacher to child*, and child MLU ranging from 1.1 to 3.9. The greatest discrepancy was with Bronwyn, who was the elective mute, and the teacher was responding to her receptive level which almost certainly reflected her capabilities had she not been withholding speech.

The significance of teacher MLU stems from the knowledge obtained from mother-child studies (see Mahoney & Seely, 1976, for a review) where it has been shown that normal mothers modify their language in accordance with the child's level, ideally providing a complexity level just in advance of the child's, and increasing it as the child's MLU increases in length. The period of greatest modification is when the child is at the stage of using from 1-5 words.

The acceptable discrepancy between child and mother MLU, in terms of facilitating comprehension, ranges from 2.5—4.3 for children with an MLU of between 1 and 3 words (Glanzer & Dodd, 1975). On this basis the data presented for the teacher in interaction with her eight pupils indicates that her utterances were probably of an appropriate length to facilitate comprehension.

4. Verbal teaching strategies in interaction sequences

Table 7 **Strategies used in teacher-pupil interaction sequences**

Strategies	
Teacher demand : pupil response	70%
Facilitation strategies : feedback	30%

Research has suggested that there are at least two models for eliciting and stimulating language behaviour.

1. demand—response—facilitation or modification—response—feedback (Leeming et al., 1979)
2. commenting—modelling (McConkey, 1979)

The former has been widely used in language programs developed during the 1970's. The latter was derived from empirical research with parents teaching their own pre-school language delayed children (McConkey & Cheseldine, 1979), in which it was found that a high rate of adult demand and adult questioning ensured adult domination of the interaction and resulted in reduced child verbalisation.

Data collected in this study showed that parents who used a high proportion of demands and questions in their language were less successful in teaching their children to say single words than parents who commented on what the child was doing and saying and provided models of the words the children were learning to say. This raises important questions about the adequacy of the interaction which takes place in the classroom when as much as 70% of verbalisation is in the teacher-demand pupil-reponse mode.

The need for further research in this area is critical, and should include an attempt to evaluate the effectiveness and importance of various facilitation strategies such as reflection, expansion, provision of partial response and feedback.

Implications

The uses to which language is put in a classroom situation are many and varied, but, where the children are delayed and still in the process of acquiring their early language skills, it is crucial that the teacher ensures that much of the interaction that takes place is facilitative. This pre-supposes adequate knowledge and training about how language is acquired and how to provide facilitative environments and experiences. It also demands a high degree of self-awareness and control on the part of the teacher, and detailed knowledge and understanding of the language stages reached by the children in the classroom, to ensure

that each child has the opportunity to participate frequently at an appropriate level. The issue of participation is critical in view of the evidence which suggests that the amount children talk is related to growth in the range and complexity of structures that they use.

A survey conducted by the Department of Education and Science in 1979 in the United Kingdom revealed that 42.5% of educationally sub-normal children reach the age of 16 without being able to use grammatical constructions, and just less than half this number cannot produce single words (Leeming et al., 1979). These results suggest that, for many of the children, the educational system was not producing steady increments in ability in the most important area of language ability. The suggestion that the inherent characteristics of the developmentally delayed prevent any efforts at intervention from achieving success has been disproved by the many documented reports of the successful learning achieved by these children, given the right conditions and techniques. The alternative explanation is that what happens at present in schools for these children is ineffective in bringing about language growth. The necessity for modifying these approaches, so that language teaching is effective, led to the establishment of the Curriculum Development Project whose task was to devise methods and curricula for teaching language and communication to the developmentally delayed in classroom settings. This was achieved by developing a model of the teaching process, which was then put into practice in an intervention study with six teachers who were asked to teach three lessons to a group of children in the area of language. The first lesson was followed by a full day of evaluation with the curriculum development team, on the basis of which sample lessons were drawn up based on the model. The lesson was re-taught, and then a third lesson was taught, without access to the advisory team, but with the benefit of evaluation afterwards. Benefits which the teachers articulated were increased awareness of the fact that language teaching needs to be carefully planned, with specific objectives suited to the level of each child participating, rather than assuming that a stimulating environment with a lot of verbalisation taking place will be adequate. Information about each child's abilities and interests are essential to ensure that activities planned will enable all children to achieve specified outcomes at differing levels of difficulty, but still within a group teaching situation, which is suited to all the children in the group. Teachers reported an increased sensitivity to their own language, both in terms of the amount they talked and the complexity of their statements, and their awareness of the need to ensure that pupils talk more and have opportunities to initiate. The benefits of deliberate planning for individual and small group learning were obvious.

Well's (1981) study of language development in pre-school children has re-affirmed the importance of Vygotsky's earlier notion of the 'zone of proximal development' in which he states that the child can accomplish more in interaction with an adult than he can alone (Rogoff & Wertsch, 1984). The child needs a shared framework until his or her linguistic skills are very well developed, the teacher must understand the child's conceptual framework, and must support and extend the child's meaning in the same way that the parent does in the early stages of language acquisition. The classroom teacher must assess the widely differing experiences and language that each child brings to school, and plan activities to build on these foundations. For this to be accepted as essential practice there may need to be a shift in the values which direct much of the teacher dominated activity in traditional classrooms. Ede and Williamson (1980) emphasize the importance of viewing school as a place where the affective domain is as important as the cognitive, where a child is encouraged to initiate interactions with peers and adults, to express desires and feelings, to make cooperative plans, and to use language to be assertive. Teachers need to learn to be responsive to children in the same way that parents are, to

encourage the child's communicative attempts by commenting and questioning, and to draw the child into further exchanges. Shared experience in a structured task, which is the focus of joint attention between adult and child, is likely to give rise to the highest level outcomes in terms of communicative skills. Such a situation does not occur sufficiently often in the pre-school setting, let alone the school setting, but for the development of language skills in delayed children it is essential, and must be deliberately built into the daily program.

Beveridge (1981) has stated that the development of functional social relationships is a crucial factor in the development of communication. Situations which facilitate communication are those in which social relationships are well defined and functionally related to goals the child can understand. The implications for curriculum planning for effective teaching of communication skills are many, and involve looking closely at many of the interactional features which make the home a facilitating environment for the acquisition of language skills. These include a number of important points.

1. Ensuring that opportunity exists for the child to talk about familiar events, actions and objects present in the here and now. The capacity to communicate about objects and events that are not present will occur later.
2. Children can be encouraged to communicate by concentrating on their individual needs—requesting a special toy, a particular type of food or drink.
3. Often overlooked is the need to allow children adequate time to express their wishes. Slow learning children with limited language skills are often hesitant, and frequently the busy classroom routine does not allow time for the more hesitant to participate, but unless they do their chances of becoming more fluent will always be limited.
4. The teacher must ensure that joint attention is established, with both eye contact and physical contact where appropriate.
5. Equally important is ensuring that children are attending both to the focus of attention and to what is being said.
6. Within the conversational exchange children must learn to signal when they have been misunderstood, and when they don't understand what has been said to them.
7. They need to be able to use a number of fundamental repair strategies, such as asking for feedback, re-directing the other person's attention, learning to say 'no', and checking to see that their partner is listening.
8. The child must learn adequate turn-taking skills.
9. Well developed listening skills are crucial.
10. The child must learn to follow the 'rules' in paired and small and large group exchanges, in games, and in different social settings such as the difference between socially acceptable behaviour in the classroom and the playground.

Teachers need to have a very clear picture of children's functional language in a variety of contexts—the classroom, the playground and at home. Similar demands should be made by all the significant people with whom children interact in all settings, demands which ensure that if they are capable of verbal communication, non-verbal responses will not be accepted, and they will continually be encouraged and extended to perform at a maximum level. The next step must be continually re-appraised and any attempt to teach communication should be seen as a bridge between what children *can* do, and what is going to be required at the next stage of development.

The demands upon teachers who attempt to fulfill their task of teaching communication in the classroom context are enormous but the reward for success in this endeavour is the knowledge that, with adequate communication skills, children are equipped for learning a

variety of essential cognitive tasks, as well as for engaging in satisfying and successful social interactions with both adults and peers in all the significant settings in which they function. Heightened teacher sensitivity to their own organizational and verbal behaviour is essential. This can be assisted by the tape recording of brief sessions of classroom interaction and the analysis of teacher and pupil participation. Explanations for current patterns can lead to modifications in current procedures to ensure that the environment is enhancing the acquisition and usage of communication skills to the maximum degree possible.

Chapter 10

PICKING THE LITERACY LOCK

A discussion of how best to teach reading
in the light of three current theories of reading

Trevor Lloyd
Judith Goyen

'For adventure unlimited,' says the caption, 'READ on!' Hundreds of thousands of Australian adults know little or nothing of such excitement. For many it is because they choose otherwise. For many others it is because, for them, the gates will not open. They cannot pick the lock. They cannot read.

It has been estimated (Goyen, 1977) that approximately one in twenty-five adult Australians is functionally illiterate in English. For adults born outside Australia in a non-English speaking country, the proportion rises to one in two. In all, the larger part of a million adults has been, for practical purposes, untouched by aspirations towards universal literacy. And in view of the present-day policy of passing the schools' 'failures' on from year to year within the system without keeping account of measurable achievement, the situation, without intervention, has little likelihood of improvement. How can the large number of poor readers in this country and elsewhere be given access to the reading code? There is no simple answer. Indeed, there is considerable disagreement regarding what is actually taking place when *anyone* converts the so-called 'retinal flutter' into an understanding grasp of what the writer was bent on communicating.

Reading theorists active over the last decade have typically been divided into three camps: bottom-up, top-down and interactive.

To adapt a Jorm (1983) metaphor, the *bottom-up* group describes readers as rather like a party of hikers finding its way along the various trails of a jungle to a pre-determined destination by means of signposts and markers set up at each intersection and at frequent locations along the way. *Top-down* theorists picture the reader as resembling an explorer with a good knowledge of jungle terrain who keeps an eye on the surrounding peaks, gives cursory glances at a map of the region and makes his/her way confidently forward with an inbuilt sense of compass directions. The picture painted by *interactive* theorists suggests a company of hikers who admit to using both an overall knowledge of the field *and* the provided stage by stage markers—allowing the clues opened up by one to evaluate the directions suggested by the other.

These three types of reading theory are worth looking at in closer detail. There are certain teachers of reading who are uncomfortable until they understand why they should teach in a certain way. There are other teachers who have no use for theory. This latter group ought to pay particular attention. They may not consciously use a reading theory but they may unconsciously *be used* by a theory and a poor one at that.

1. The Bottom-Up View: Begin at the Beginning

Philip Gough of the University of Texas has developed a theory of reading based on the contention that the typical way of converting print to meaning is to move systematically through the sentence 'letter by letter, word by word' (Gough, 1976, p.532). The letters are built into words and words into sentences. Once understood, the sentences are mentally directed away from the point of immediate attention, and additional sentences, already being received at the level of letters and words, are similarly processed. The actual stages for Gough are *icon, letter identification, word synthesis*, and *storage of successive words in the primary memory*, where they are worked on for *comprehension* and passed on to *secondary memory*. These stages are looked at in closer detail in the following:

1. The *icon*, or initially unprocessed visual image, is made up of the stimuli within an oval shape approximately five by two and a half centimetres. This is typically made up of 15-20 characters (including spaces) and will last 100 msecs.
2. With the above raw image available, the mind brings a *scanner* into operation to test whether the icon contains previously mastered shapes. If this is so, they are identified as letters as they are recovered individually from the icon at 10-20 msecs per letter and clustered into strings of phonemes.
3. These strings of phonemes in their turn are applied to the *mental lexicon* where they are laid side by side with words already in store.
4. Phonemes finding a match in the lexicon are transferred to *primary memory* as words, which accumulate to the capacity of this short term store, and are worked upon there for comprehension. To be comprehensible, a sentence fragment must not exceed the capacity of the primary memory. The actual means by which comprehension takes place is not given; however, the personally understood rules of syntax and semantics are said to play an important part.
5. Once understood, the sentence portions are passed into *secondary memory* from which they can be drawn for oral presentation in line with the known rules of phonology. All of these stages may be achieved for the reader in less than a second.

In view of the fact that sentences are progressively constructed in print from letters through to words and phrases, there is a certain amount of appeal in Gough's explanation of how reading actually takes place. However, there are a number of difficulties with the theory, too, and these will be discussed when the views of fellow bottom-up theorist Samuels have been noted.

Jay Samuels (1977) suggested a series of stages in reading similar to those proposed by Gough, with an additional element which helps to some extent to explain why, under some circumstances, particular stages are passed over. That element is *automaticity* which determines how closely the reader has to concentrate on the decoding process at all levels from basic features (for example, lines and circles) to letters (for example, 'b' and 'q'), combinations of letters (for example, 'sh' and 'ing'), spelling patterns and words.

As Samuels describes it, the understanding of a passage in the 'deeper semantic-linguistic centres of the brain' requires two processes: decoding and comprehension. The problem is that the reader can focus on but one of these processes at a time. This is achieved by the practice of attention-switching (Samuels, 1977). Like the novice car driver who needs to concentrate closely on use of brakes, accelerator and steering, the beginning reader is using a great amount of attention on examining elements, letters, digraphs and words. By contrast, the skilful reader, like the accomplished car driver, performs the basic processes automatically so that almost total attention can be given to the higher level tasks. This means, for Samuels, that while the reading process is still logically and psychologically a bottom-up process, experienced readers will not always need to go to the very bottom of the hierarchy in their work of cracking the reading code. For example, they may interpret a

vertical line and a circle automatically as the letter 'b'. Indeed, the blend 'bl' may be automatic or more likely still, the word 'blind' may be recognized immediately from visual memory while its meaning may also be automatically accessible from semantic memory. Further, under some circumstances, even syntactic/grammatical structures (for example, 'pull down') might be so familiar as to be recognised, as a whole, automatically. However, points out Samuels, attention could be expected always to be required for determining the all-important syntactic relationship between grammatical units (for example: 'To reduce . . . the glare . . . on the page . . . he decided . . . to pull down . . . the blind'). Such a process is at the heart of comprehension and consistently requires conscious effort (Samuels, 1977).

In his 1977 paper, Samuels makes considerable concession to top-down and interactive theory by subsuming an hypothesis/test element within his automaticity model. On this view, he allows that 'semantic memory', or prior 'knowledge and comprehension of the text', determines the level at which the immediate items in visual memory are processed. Thus readers would gain personally available 'automatic' information from the page, predict possible meanings for the non-automatic words and expressions and then use all available clues such as word length, spelling rules and over-all configuration to test their predictions. Words which make sense are accepted while others are rejected. In the latter case, the reader might seek additional visual information, even, presumably, applying letter-sounding techniques.

If bottom-up theorists such as Gough and Samuels are to be taken seriously, there are some important implications for the teaching of reading arising from their views. These include the advisability of frequent practice in making and recognising the elements of letter construction (lines and circles, for example), practice in stating the initial sound of spoken and written words, and practice in providing words commencing with a given sound. In addition, Samuels' hypothesis/test model implies (as he does himself) the usefulness of training in predicting missing words—first from spoken sentences and then from written sentences, either with or without the initial sound/letter of the word to be provided.

It is evident that there are a number of difficulties in accepting a purely bottom-up view of the reading process. By restating this theory, Samuels is already conceding that unlocking the printed code may well be accomplished without resorting to the elements and laboriously piecing them together from left to right, word after word, line after line.

An examination of the kinds of reading mistakes ('miscues' in the present jargon) made at all levels of reading development makes it evident that the reader is using a good deal of input apart from what is in the print itself—for example, prior knowledge of the subject, stored in long-term semantic memory, and an intuitive grasp of the grammar of the sentence. Wixson (1979), in a review of a wide range of miscue studies, reported syntactically acceptable (for example, noun-for-noun or adjective-for-adjective) reading 'errors' as ranging from 70% to 81%. Semantically acceptable errors, ranging from 44% to 61%, were also much higher than might have been expected from a simple left to right decoding process. As well, she reported that, while 42% to 85% of grammatically unacceptable errors were corrected, both less proficient and more proficient readers were content to allow the majority (58% to 68%) of their grammatically acceptable errors to remain uncorrected. This all raises the question of the importance of readers' prior knowledge in their ability to unlock the printed word. The matter is aired widely by the second group to be noted: the top-down theorists.

2. The Top-Down View: What You Bring is More Important Than What You Find

Psycholinguist, Frank Smith, is a leading proponent of top-down reading theory. From his introductory writing in the early 1970s, Smith contended that the reading process was not so much a move from words to meaning as a progression from meaning to words (Smith, 1971). On this view, he claimed that what the reader brings to the print by way of previous knowledge and experience and by way of grasp of the grammatical rules of language is more important than what the reader gets from the print. A person well endowed in these respects was seen as requiring much less detailed information from the page in order to understand what the passage is seeking to communicate.

Smith (1971) also raised the notion of reduction of uncertainty. He pictured readers in their quest for information as using the visual process to reduce the number of alternative possibilities. For example, in the Australian context, imagine a student wishing to know when Europeans first penetrated the Blue Mountains barrier. The reader already knows the years of Lachlan Macquarie's governorship and reading uncovers the fact that the crossing took place under Macquarie. This new information reduces the reader's uncertainty about the possible years of the first crossing to something like the second decade of the nineteenth century.

An intuitive grasp of the grammatical rules of the language was also seen as a means of reducing uncertainty. This type of syntactic sense allows readers to predict many of the words in a sentence, because they are actively engaged, while reading, in generating their own relevant sentences. For example, the expression: 'In the . . .' is seen as requiring a noun (e.g. cabin) or an adjective+noun (e.g. aft cabin) which in turn is to be followed by either a pronoun or yet another noun (e.g. 'In the aft cabin, the skipper . . .'). All of this, combined with some semantic familiarity with the subject matter, creates an active print-unlocking situation and continuously builds up the sight vocabulary.

In a more recent publication, Frank Smith (1978) examines in some detail the processing of visual information and the role of short-term and long-term memory in the reading task.

> All readers, he points out, are confined to four or five fixations a second and each fixation is limited to encompassing but four or five items at once. The items on which the reader focuses can be individual letters (Smith calls this 'tunnel vision') or clusters of letters (that is, frequently, words) or, commonly, clusters of words and phrases. The amount of visual information processed in this way is continuously determined by the amount of relevant semantic and syntactic information which the reader possesses. Now short-term memory can hold just six or seven items at a time, and if we are 'to make sense of what we are attending to at a particular time, we must be able to make sense of the contents of short-term memory. What the reader should be encouraged to do is to make the half dozen or so memory *chunks* as large as possible so that the understanding process has more information to work on.

Smith further exemplifies the attitude of top-down theorists in his view of long-term memory. It is there that the vital non-visual information is kept in readiness for interpreting the visual samples gained from the print. Further, it is by adjustment of the existing long-term association networks that understanding and learning can take place. Nonsense is said to be something which cannot be related to the structure of knowledge already held in long-term memory. (Such a reference to structure is not a lone Piagetian allusion. Elsewhere, Smith (1978) dubs what we have in our heads an 'intricately organised and internally consistent model of the world'—a system and a 'theory of what the world is like' which is the basis of all learning and other mental functioning). On bases such as these, Smith advises teachers to avoid springing fact-type questions on readers at the completion of their reading and to practise raising concept-type questions with the readers before the passage is tackled. In a conclusion with far-reaching implications for the effective

teaching of reading, Smith lays down that 'prediction is asking questions—and comprehension is getting these questions answered', the 'basis for making sense' of things. Comprehension understood this way is not a quantity to be measured; rather it is the 'state of not having any unanswered questions'. Given the correct prerequisites, the process of comprehension, for Smith, continues throughout the reading task. On the basis of what readers already know, they predict certain answers to questions they may themselves raise. In other words, they are engaged in 'conducting experiments' as they go along. With this in mind, Smith suggests that knowing what type of question to ask for a particular kind of writing is one of the most valuable skills involved in the reading process. When readers are unable to formulate suitable questions as they read, the material is either beyond their understanding, is boring or is nonsense.

True to type as a top-down theorist, Smith plays down phonics as the major force in extracting meaning from print. He claims it is conceivable that every word needed by the reader could be mastered 'on sight' by such processes as predicting from context and from similarities to known words; and that those words not achievable by this means can either be ignored, guessed at, or explained by some other person. Two practical problems with phonics are raised by Smith—their inconsistency and the extreme difficulty that many readers face in using the blending of sounds to decode words. On this latter point he remarks that 'phonics works if you understand the word in the first place.' Relatedly, he reports a cynic as observing that the 'smartest children keep one phonics lesson ahead of the teacher—and the smartest teacher keeps one lesson behind the children.' However, Smith does allow *some* place for phonics. Viewing reading as a process of reduction of uncertainty, he sees the use of, say, the opening sound of a word as a helpful way of choosing amongst likely guesses at a word (Smith, 1978).

Coming to practical matters or classroom decision-making and procedures, Smith has little time for notions of reading readiness and reading threshold. He believes that most of the understandings and skills will come by actually engaging in the right type of reading activity and that reading commences the first time learners make sense of the print offered to them. At the same time, he warns against strictly sequenced teaching programs in reading which bring in, regardless of the learner's needs, batches of phonic drills and sound-blending which may encourage tunnel vision, overload the memory and bring on boredom and confusion. In Smith's view, there is danger in remedial teaching which directs the struggling reader's attention away from meaningful passages to the so-called basics of isolated word recognition and phonics drill.

Smith encourages teachers of reading to see their work as centring on the following provisions:

> choice of reading material that makes sense to the learner (making sense of print is in fact learning to read); grading the reading material carefully so that the task is always easy ('children learn to read by reading'); reading to children so that they come to see the purpose of print and gain familiarity with its conventions; reading *with* children so that they may join in the business of predicting and can themselves pull ahead of the teacher's deliberately chosen reading rate; and using words meaningfully as labels and captions in the classroom environment.

A further example of a top-down reading theorist should be noted. In spite of his claim to developing an *interactive* model for the reading process, the great bulk of Kenneth Goodman's writing apears to align with the top-down view of the reading process. As early as the late 1960's, Goodman gave notice of his viewpoint in an article that dubbed reading as 'a psycholinguistic guessing game' (Goodman, 1967). He related his work to transformational grammar and argued that learners' syntactic and experiential backgrounds were vital to the type of predictions they used in reading. Supporting his remarks with examples

from his well-known 'miscue analysis', Goodman showed that the miscues made by readers may well be grammatically and semantically consistent with the passage being read. Moreover, the 'perceptual input' made by readers is noticeably selective and clearly influenced by their subjective expectations.

On into the seventies, Goodman continued his criticism of traditional reading schemes as denying learners the chance to read something that makes sense until they are well into reading instruction (Goodman, 1975). He saw much teaching of reading as fragmenting language and making it more difficult to extract the meaning. To compound the problem, he argued, learners who do not master the process first time around are sent back to remedial programs which further emphasize difficult abstractions. As an alternative, he advocated that 'from the very beginning, the child needs to be reading whole, relevant, interesting language that makes sense' (Goodman, 1975, p.632).

In 1978, Goodman was involved in a national study of reading in the United States (Goodman & Goodman, 1978). His report on the project continued to stress reduction of uncertainty, selectivity, active construction of meaning on the part of the reader and the use of semantic and linguistic competence to minimise the need for use of visual detail. He presented at that time a revised model of the reading process ranging from optical scan, through perception and the assigning of deep structure to the construction of meaning and its assimilation or accommodation within the existing mental/conceptual constructs. As with Smith, Goodman believes that prediction plays a key role for the reader in determining meaning in printed material.

It is important to enquire at this stage whether an exclusive top-down view of the reading process is tenable. Research carried out during the 1970's and 1980's has, in fact, raised some problems for the Smith/Goodman school, particularly in the area of phonological recoding.

According to top-down theory, the driving force for effective reading comes from the non-visual, semantic and syntactic information brought to the task by the reader. It is further claimed that phonological recoding (that is, the rehearsing of phonic sounds for identifying unknown words) is resorted to mainly by poorer readers who are unable to predict unfamiliar words from context and grammar. Such a practice Smith would describe as 'tunnel vision'. It is inferred that phonological recoding is a tactic little used by effective readers. In view of the foregoing, it might be expected that effective readers have no special skills in the field of phonics. Indeed, if average to good readers were found to be no better at phonological recoding than poorer readers, then this would give significant support to this feature of top-down theory. However, the weight of research evidence does not lean this way. In fact, better readers are also far superior at reading context-free words and lists of pronounceable nonsense words. For example, Rozin and Gleitman (1977), after reviewing the relevant literature, reported that 'the ability to make explicit phonological distinctions distinguishes between younger and older individuals and between good and poor readers'. Similarly, Stanovich (1980; 64) indicated that good readers not only recognise memorised word wholes and 'sub-word units' more rapidly, but also 'appear to have superior phonetic segmentation and recoding abilities so that they can rapidly decode a word even when visual recognition fails'.

Important early work in the field of phonological recoding was carried out by Firth (1972) at the University of New South Wales. He studied a number of eight-year olds divided into average readers and poor readers with each group subdivided again into average intelligence and low intelligence. Each groups was given a list of 170 nonsense words. The average readers performed dramatically better than the poorer readers, irrespective of

their intelligence. Firth discovered that not only did the poorer readers recode fewer words but, in addition, they recoded individual words much more slowly. Snowling (1980) obtained similar results. She reported that retarded readers use their phonic skills more poorly and, in addition, their use of these skills did not seem to improve with age compared with normal readers. Bradley and Bryant (1978, 1983), Stanovich, Cunningham and Freeman (1984) and Share, Jorm, MacLean and Matthews (1984) have also shown that phonological awareness and recoding skills are of prime importance in accounting for reading ability in beginning readers.

It could, of course, be argued that the superior phonological awareness of the more proficient readers is a consequence of their better reading ability. Not so, say Bradley and Bryant (1983) and Torneus (1984), who argue for a causal connection in the reverse direction. By testing prior to the emergence of reading itself and by examining the effectiveness of phonic training on young pre-schoolers, Bradley and Bryant were in a position to report that lack of phonological awareness was a significant *cause* of poor reading performance. Torneus, writing from Sweden, came to the same conclusion after conducting a longitudinal study on 46 dyslexics and 44 controls.

Results reputedly contrary to the findings cited above have been reported in an Australian study by Rousch and Cambourne (1979). They took a total of 130 children from Years 2, 4, 6 and 8, divided into distinct reading groups as described as 'proficient', 'average', 'low ability' and 'special' (that is, with special learning difficulties). Each child was given a story to read for miscue analysis. The chosen stories were carefully graded so that they extracted the same amount of reading 'strain' for each level; that is, the more capable readers were, in true miscue analysis style, intended to be dealing with more difficult passages than were the less capable readers. Over 12,000 reading miscues were isolated and analysed in terms of twenty categories each.

Of special interest to Rousch and Cambourne was the fact that from group to group, the range of miscues with high graphemic similarity and with high phonemic similarity to the original was quite small (for example, from approximately 23% to 30% and 20% to 24%). In contrast, from group to group, the range of miscues with high syntactic acceptability and with high semantic similarity was quite large (for example, from approximately 35%, for the special group, to 70% for the proficient group). On the basis of these findings a number of fairly confident conclusions were drawn. It was taken 'that children suffering from a special learning disability were not disabled because they failed to use as much graphophonic information as the other readers' and that the disabled group was 'at least as competent in coping with the graphophonic parameters of print as proficient readers' (Cambourne, 1983:25). It was further concluded that, if the letter-sound correspondence or graphophonic aspect alone were to be observed, 'one would be hard put to distinguish the proficient from those diagnosed as having reading disability. This finding conflicts with a commonly held view that children suffering from a learning disability cannot cope with the graphophonic aspects of print.' Cambourne went on to suggest that disabled readers have learnt to tackle the reading task the wrong way—their 'close attention to graphophonic tactics has so taxed *working memory* that there is insufficient remaining for the purpose of monitoring semantic and syntactic sense' (Cambourne, 1983:31).

Is it possible to reconcile the findings of Firth, Snowling, Stanovich, Bradley and Bryant and others with those of Rousch and Cambourne? A number of relevant points can be made. At the outset it should be recalled that Rousch and Cambourne intended that the different ability groups should not be dealing with reading material of the same absolute difficulty—rather, each was to have material exacting reading 'strain' commensurate with reading ability. Rousch and Cambourne did not indicate the basis on which they chose the reading

material and determined its level of difficulty. Hence, we have no means of confirming that the conditions, even as they described them, were as stated. Further, on Rousch and Cambourne's own terms, there seems to be a serious flaw in the logic. If, indeed, the more 'proficient' group did have more demanding material to read, then, it might well be presumed, such material would have greater graphophonic complexity. On this basis, alone, it ought not to be concluded that the groups were equally competent in making connections between letters and sounds and that tasks involving these skills did not serve to distinguish between the groups. Moreover, it can be pointed out that an exclusive study of miscues can obscure the extent to which letter-sound correspondence data are processed successfully. Rousch and Cambourne's study, as for all miscue analysis, can tell us nothing of the number of *effective* phonological recodings managed by the proficient readers by comparison with the low ability and disabled readers. Indeed, it is quite feasible that should such details be known they might not be materially different from the contrary findings of Firth and others.

A further point should be made. Cambourne was prompt to use Smith's explanation of the reading pocess to explain the difference between the scores which had been obtained. In fact, by Smith's own account, neither the graphemic, nor the phonemic abilities of the proficient group need have been put to the test in the situation described by Rousch and Cambourne. It will be remembered that Smith pictured the capable reader as impelled by his/her own semantic/syntactic store and as merely visually sampling the print to maintain a satisfying level of prediction of the content of the passage. Such a high level practice is hardly a fair test of the true graphophonic (and, hence, low level) skills of the child. Cambourne's explanation regarding the disabled reader's deficiency of 'working memory' is something of a two-edged sword. If the poor reader's close attention to these tactics has brought about this drain on working memory, then it can hardly be accurate for Cambourne to claim (as he does) that this group is 'at least as competent in coping with the graphophonic parameters of print as proficient readers.' In fact, it appears reasonable to maintain that a major factor in the disabled reader's problem is a lack of phonological awareness and skill.

All of this is not to suggest that top-down theory has added little to our understanding of how print is translated into meaning. However, it does seem that top-down theorists have under-estimated the possible role of phonological skills in normal effective reading. Could it be that successful readers are recoding letter and sub-word sounds so rapidly that the technique is repeatedly, though selectively, being used as part of a total spectrum of sentence attack skills? The proponents of *interactive theory* believe so. They are to be noted in the following section.

3. The Interactive View: Hypothesis Formation and Confirmation at all Levels

Thus far, it can be seen that bottom-up and top-down theory stand in fair contrast. The one features systematic element-by-element processing with letters accumulating into words and words into phrases and sentences. The other stresses non-visual semantic/syntactic information already possessed by the reader, selectivity in the use of printed visual information and prediction of both words and overall meaning of a passage. However, it should be noted that recently the two groups have made some moves towards each other. As already noted, Samuels' revised bottom-up model develops the notion of automaticity and the chunking of the visual information so that not all of the detailed elements are attended to. Meanwhile, from the opposite viewpoint, Smith has conceded a place for phonics and Goodman has claimed to be an interactionist. As will be illustrated below, the better interactive models involve more than a simple eclectic response to the best in both theories.

Rumelhart (1977) was intrigued by the fact that grammatical consistency of both infant and adult readers' substitution errors can range between 90% and 98% and that we have little trouble in semantically disentangling the ambiguity of such sentences as:

They are eating apples.
The figures on the right hand side of the table were larger than those on the left.

He concluded that several knowledge sources are applied at once in the recoding process and that the final outcome is 'the product of the simultaneous interaction among all of them' (Rumelhart, 1977, p.588). He postulates six knowledge sources, arranged in levels from high to low, as follows:

Semantic Level
Syntactic Level
Lexical Level
Letter Cluster Level
Letter Level
Feature Level

The ***semantic level*** relates to clues provided to the reader by the context—either via accompanying language or pictures. On the basis of context, Rumelhart describes the reader as hypothesizing that an unknown word will be one of several alternatives. This initial hypothesis remains to be tested against the remaining levels/sources of knowledge.

The ***syntactic level*** refers to the information passed on by the reader's knowledge of grammatical forms. For example, if the reader recognizes the determiner 'the' as preceding the word to be recoded he might note that the sought-after word has to be an adjective or a noun and this knowledge is used to confirm or disconfirm the original hypothesis.

While this has been going on the reader has scanned the print in the unknown word (the 'graphemic input') and passed it into the 'visual information store' (VIS). A 'feature extraction device' is applied to the VIS (for example, picking up circles and straight lines) and this is passed on to a 'pattern synthesizer.'

In the pattern synthesizer, the ***features*** (presumably of the first letter, in particular) in the word might be compared with the reader's existing orthographic knowledge and a decision might be made regarding the first ***letter*** or any other. This letter, together possibly with the adjoining letter(s) to form a letter cluster, might then be used to confirm/reject the original hypothesis. In the event that all of the high level hypotheses are rejected, the lower (orthographic-type) levels might be used to generate the second round of hypotheses. In other circumstances, where context was of little help, the original hypothesis might derive from the lower levels.

If there were still doubt about the sought-after word, further attention might be paid to the ***lexical*** (or word) ***level***. This might come via a turn to the letter cluster level, for example, by comparing parts of the word with parts of known words. Alternatively, a return could be made to the letter level followed by systematic phonological recording of the whole word. Yet another effort at the lexical level might be to recognise the word as a whole. This might well have been carried out much earlier, and even constitute one of the earliest hypotheses to be confirmed/rejected by resort to both higher and lower levels.

From the above, it can be seen that Rumelhart's theory of the reading process is more than an accumulation of the more promising parts of the top-down and bottom-up views. Rather, it postulates simultaneous processing at several levels with hypotheses initiated at the more promising levels and tested against other levels, hence the term ***interactive***. As a further illustration of the way the exponents of the various theories seem to be moving towards each other, it is worth noting that Smith (1978) regarded guessing at new words as 'reasoned hypothesis testing.'

Stanovich also falls within the interactive camp. To the Rumelhart model he adds a 'compensatory' function (Stanovich, 1980), describing the reader as using information from all

levels from semantic down. Where there is a deficiency in any of these knowledge inputs, due to the reader's limitations, there will be a compensating additional dependency on one or more of the other inputs. This follows regardless of the level of the deficiency in the knowledge hierarchy. For example, a poor reader might have a weakness in semantic background for a particular story and hence compensate for this by relying more particularly on the lexical (word whole) level. Alternatively, Stanovich would argue that it is just as likely that the deficiency for the poor reader would be at the lower hierarchical levels (letter or word whole, for example) with compensating reliance on the semantic or syntactic levels.

To date, interactive theory has stood up generally well in the face of evidence continuing to emerge from the field of reading research. Some of this was reviewed in the previous section on the top-down theory. One possibly dissonant finding should, however, be noted.

Interactive exponent, Stanovich, cited evidence that 'increased word recognition speed leads to improved reading comprehension.' (Stanovich, 1981, 157). Such a view is consonant, of course, with the view that strength in one part of the hierarchy of knowledge sources will affect performance at other levels. In fact, Fleisher, Jenkins and Pany (1979) have shown that the improvement of a poor reader's speed of recognition of words in both random lists and in context is no guarantee of improved comprehension performance in a passage using those same words. They took poor readers and good readers from fourth and fifth grades. The poor readers were divided into experimental and control groups and the good readers were used as a control group. The experimental poor readers were drilled in word recognition until their performance (92.91 single words per minute) was far beyond that of the control poor readers (43.36 words) and very close to that of the control good readers (99.50). However, tests of comprehension showed the experimental poor readers made no significant progress in comprehension. It should be noted that Fleisher et al realised at the outset that the link between word recognition and reading comprehension can be postulated in two forms: firstly that rapid word recognition is a *sufficient* condition for successful comprehension and, secondly, that rapid word recognition is a *necessary* but not sufficient condition for good comprehension. They concluded ultimately that the research disproved the first (sufficiency) hypothesis and gave support to the second (necessity) hypothesis.

All of the material presented to date suggests that, while the hierarchy of knowledge sources may be an important construct in our understanding of the reading process, the links between the levels in the hierarchy may be quite complex and not easily described. Word knowledge, ***of itself***, may not have a direct bearing on the semantic schemata because such a situation fails to take into account the necessary roles of factors like short-term memory in the rehearsal of significant parts of the sentences and like the grasp of finer syntactic relationships within the grammar of the sentence. So in spite of the difficulty which interactive theory may have in clarifying the complex relationships between the knowledge levels contributing to a successful picking of the literacy lock, it is concluded that this theory is the most promising of those presently in use. It suitably relates and combines in a way of its own the strengths of the other two theories and is readily adaptable to changing circumstances and to individual needs.

To return to the hiking/exploring metaphor mentioned earlier, it seems that the best way to help emerging readers negotiate the devious pathways and entanglements of the world of print is to give them encouragement for keeping their mind simultaneously on both the existing and growing knowledge of the field of interest *and* on the immediate stage by stage markers along the route—allowing the ideas raised by one continuously to influence

the conclusions suggested by the other. More along this line is to be noted in the following section where the implications of reading theory for teaching method are to be discussed.

4. Implications for the Teaching of Reading to Poor Readers

It is one thing to settle upon what seems, at least at our present stage of research and understanding, to be a fairly satisfying theory of the way *successful readers* go about translating the alphabetic code into understanding of meaning. It is another matter to claim that teachers of reading can rightly make direct inferences from such a theory regarding the way *poor-readers* should go about learning to read.

Top-down exponent, Smith, spends little time on such questions. He is convinced that when we know the mix of intellectual skills (for example, memory, risk-taking, nature of language, and so on) there may be little else to say about reading and how we should go about teaching it. Under those conditions, he claims, 'instructional implications become self-evident.' 'To learn to read children need to read' (Smith, 1978).

On the other hand, Mathews, writing in the mid-sixties, was not so sure about the closeness of the reading and learning-to-read notions. He claimed that 'reading is so familiar to us that we are likely to forget how difficult it is for the beginner.' This led him to give advice which may well sound like heresy to ears even slightly tuned to top-down or interactive theory:

> The child has so hard a time forming a connection between visual marks and speech sounds that he cannot attend to the meaning of what he reads. We must help him to establish this connection, and we must not bother him, for the present, with anything else.
> (Mathews, 1966. p.165).

As recently as 1978, Calfee and Drum were ready to ensure the general position taken by Mathews. They concluded that 'it is by no means clear that the proper method for acquiring . . . competence in the varied skills and strategies used by the skilled reader is to provide direct training in those same skills and strategies.' Rather, they claimed, attention should be directed to the 'typical child' and how that child acquires the skills, strategies and knowledge 'that eventually permit him to function as a skilled reader' (Calfee & Drum, 1978:189). However, for the present discussion, it will suffice simply to realise that method-type implications drawn from reading theory must be regarded as tentative and themselves part of an on-going hypothetico-deductive attitude of mind. On this assumption, methods of teaching reading should be part of a prediction of specific results under certain conditions. Follow-up assessment can then tend to confirm/disprove both the theory upon which the teaching practice is based and, at the same time, the propriety of directly inferring learning method from theory of reading.

Keeping the foregoing in mind, this discussion now returns to a question raised in the opening pages of this paper: How can the large number of poor readers in this country and elsewhere best be given access to the reading code? Some tentative answers to this question are as follows:

1. Reading teachers ought not to try to lock their students into either an exclusive bottom-up or top-down learning situation. Neither theory is viable by itself. Bottom-up theory ignores the huge array of knowledge the successful reader brings to his/her task by way of background understanding and grammatical structures. On the other hand, top-down theory turns its back on what is becoming one of the most obvious differences between effective and disabled readers: the ability to take the printed form of the code and, phoneme by phoneme, to recode it rapidly as sound which, in turn, can then be heard as a word whole and mentally decoded into the appropriate concept. In view of these

limitations, interactive theory appears, for the present, to offer the most rewarding framework within which to work.

2. If the interactive model of reading, with its emphasis on simultaneous processing, is to be taken seriously, then a wide number of knowledge sources for the student ought to be investigated. Discussion of interests, hobbies and goals for reading could help to provide on-going motivation and guide the teacher in preparing and choosing reading materials for which the student already has some useful semantic background and, hence, a ready basis for predicting word wholes—a practice of considerable importance within interactive theory. Assessment of decoding skills might be made, for both letter names and sounds. Likewise, reading of basic word lists and of sets of graded words and sentences could be included. Spelling tests might also be worthwhile. Where the student has some literacy skills, initial tests could also include the reading of passages at or just beyond his/her present ability, to discover the efficiency of the word attack skills, particularly prediction from context, 'guessing' in view of syntax and using initial letters and other known parts of words for confirmation, in true interactive style. Because of the involvement of sight and hearing in storing and accessing the mental lexicon, obvious deficiencies in these areas might well be noted. Articulation is also likely to be relevant. Where some sounds are omitted or used poorly, phonological awareness could be expected to present difficulty.
3. Adherence to interactive theory suggests that the reading program should also incorporate existing student speech patterns. This should allow for maximum prediction on the basis of both semantics and syntax. Subsequent introduction of phonic information should allow for hypotheses to be either formed or confirmed at the lower levels, too.

   The two most important points in the program are the gaining of a basic sight vocabulary and the achievement of a fair degree of confidence in a wide range of word attack skills leading to a feeling of independence in tackling new reading.

   In the given program, sight vocabulary is to be developed along two parallel tracks: structured sentence development based on the existing language experience of the student and the use of a suitable series of readers. With the achievement of a basic sight vocabulary, the reading program can launch into phonic analysis and synthesis in earnest. Writing, spelling and comprehension are introduced from the first. The first two will aid in distinguishing letters and words from each other and the last will help to keep all material meaningful.

4. The acceptance of an interactive view of the reading process has some important implications for the immediate guidance of the beginning reader faced with an unfamiliar passage. Having provided for some sort of semantic background by such means as prior media exposure or informal discussion, the meeting of an unfamiliar word might prompt the teacher to ask what kind of word (for example, the name of something? or something you do?) the reader might expect. This could be followed by a question asking for possible examples from that category in the present subject (semantic) field. Where several possibilities are suggested, the opening letter (or sound) in the printed word could be called for as means of deciding which is the likely solution. In the face of words difficult to predict from context, the teacher might choose to launch the attack at the letter cluster level by asking the reader to look for parts of the word he/she might have met in the whole or part of other words. Where the reader has some mastery of phonics, attention might be directed promptly to phonological synthesis.

5. Adherence to interactive theory further suggests that an important consideration in all of this assistance of the beginning reader is the maintenance of a reasonable rate of sentence 'flow' in order to retain the semantic/syntactic sense. Where more than (say) 20% of the words are new to the reader, the teacher might choose to use rate-reduced teacher patterning with the student following the print as the teacher reads at a steady, yet deliberately hesitant pace (sometimes, for example, hesitating after giving the initial phoneme of a new word), to allow the reader to pull ahead slightly, predicting the new words and listening to have them confirmed. (It may be desirable for some students to have this teacher patterning recorded on cassette).

   In the event that fewer than 20% of the words are new to the reader, the teacher might still choose to use some immediate phonological patterning to keep up the word rate. To

achieve this the teacher could go straight in and give the recoded form phoneme by phoneme and give the reader the chance to try to accelerate and blend the sounds into the desired word. The goal in these guidance sessions with new passages is to develop a whole array of word attack skills which will aid the reader in moving towards a good measure of independence. When this stage is reached, given the right type of reading matter, motivation and on-going progress should be fairly much assured.

SUMMARY AND CONCLUSIONS

As a result of the foregoing discussion of reading theory, a number of features have begun to stand out more prominently. For example, each of the leading theories has something important to say to the practitioner wanting to improve his/her teaching style. Bottom-up theory draws useful attention to the letter features, letters and words involved in the reading process—but largely overlooks the reader's present understanding of the subject field and of the patterns of English grammar. Conversely, top-down theory introduces timely emphasis on semantic and syntactic background—but de-emphasises the critical phonological recoding skills in which successful readers are generally particularly capable. Interactive theory, on the other hand, appears to have avoided the weaknesses of both theories and highlighted their strengths within a flexible, meaningful model. As developed by Rumelhart, especially, interactive theory is seen as the most promising currently advocated basis for the teaching of reading; it should be applied purposefully, sensitively and flexibly—and with caution born of an understanding of the possible pitfalls in trying to infer method of teaching the beginning reader from the theory of how accomplished readers operate.

Early student interviews take on notable importance. These could cover personal interests and goals, knowledge of the alphabet and basic vocabulary, and phonological awareness. As well, informal and, where available, standardised tests of word knowledge and passage reading might be used. Spelling and writing skill could also be worth testing. Later re-tests should give useful indication of student progress, providing helpful feedback to both teacher and learner.

There is important justification for basing students' reading programs on their own experiences, interests and culture, translated into print. This approach, together with the use of carefully graded readers, can readily lead to the development of a substantial sight vocabulary. At the same time, comprehension (the asking of useful hypothesis-based questions) and simple writing should be introduced. Once a sight vocabulary of approximately one hundred words has been achieved, the analysis of words with similar structure might well lead to the isolation and re-assembling of the phonemes of the English language. A systematic coverage of these sounds should go a long way towards developing word attack independence.

Of special concern is the way the teacher helps the learner to tackle unknown words. In line with interactive theory, students should capitalise on their strongest knowledge inputs to predict such words and then move to other inputs to test these predictions. The range of options includes semantic and syntactic context, recognisable sub-word letter clusters, initial phonemes and total phonological recoding. As a further means for guiding the student in individual word attack, the teacher can provide rate-reduced oral patterning, direct phonological recoding and, even, the actual word itself.

These, then are some tentative answers to the question of how best to launch the beginning reader into the exciting exploration we call reading. Hopefully, with these principles applied, the student will be able both to decode and endorse the caption with which this discussion commenced: 'For adventured unlimited . . . READ on!'

Chapter 11

SPELLING AND THE LEARNING DISABLED CHILD

Anne Badenhop

INTRODUCTION

It has long been recognised that the spelling of learning disabled children and adults is bizarre. 'They omit, reverse, and confuse letters to such an extent that often it is impossible to guess what they are trying to write' (Peters, 1967, p.19). However, recent studies comparing older learning disabled students and younger, normally-achieving pupils with similar spelling grade scores have demonstrated that the spelling performance of the learning disabled students follows the normal developmental sequence. Some of these studies are concerned with the relationship between the developmental stages in the acquisition of reading and spelling skills, while others focus on common spelling errors. Both these issues are considered in the first two sections of the chapter. The final section examines factors that should be taken into account when a remedial spelling program is planned and concludes with an appropriate program.

1. The Relationship between Reading Acquisition and Learning to Spell

What is the relationship between reading and spelling and how close is this relationship? Both are certainly aspects of written language, but does learning to read imply learning to spell or does learning to spell imply learning to read?

> In the past, teachers only taught spelling and assumed that their pupils would automatically acquire the ability to read. Today teachers often only teach reading, and believe that spelling will naturally follow (Frith, 1980, p.496).

In order to look more closely at differences in the strategies used for reading and spelling, particularly beginning spelling skills, it is important to distinguish between a non-developmental view of reading and spelling which asserts that the child can go directly from the visual appearance of a word to its meaning (as an adult reader does), promoted by Smith (1971) and Goodman (1967) and a cognitive developmental approach (e.g. Bookman, 1984; Frith, 1980; Gentry, 1984; Marsh, Friedman, Welch & Desberg, 1980, 1981) which assumes that children's strategies will change as a function of their knowledge and experience.

Among the non-developmental theorists there are those who feel that spelling should be 'caught not taught'. Chomsky (1971, p.296) even argues that prior experience with spelling, through writing, will facilitate learning to read. 'Children ought to learn how to read by creating their own spellings for familiar words as a beginning . . . what better way to *read* for the first time than to try recognizing the very word you have just carefully built up on the table in front of you?' However cognitive developmental theorists claim that beginning strategies in reading and spelling differ. In fact, they assert that the 'top down' reading strategies advocated by non-developmental theorists like Smith (1971) and Goodman (1967) (see previous chapter by Lloyd and Goyen, this volume) may, in fact, interfere with the early learning of spelling.

> The child beginning to read can take advantage of his syntactic and semantic knowledge in reading words in context. The resulting 'top down' processing however may interfere with children's learning of the orthographic structure of words or the relationship between spelling and sound (Marsh et al., 1980, p.351).

Following a review of literature related to the development of strategies in early spelling, Marsh et al. (1980) concluded that learning to read and learning to spell entailed almost contradictory skills. Early readers rely on a visual approach to word recognition and only begin to use decoding skills by about second grade. In contrast, early spellers begin with a simple decoding strategy involving sound-to-symbol (phoneme-to-grapheme) correspondence (e.g. 'a' as in 'apple' = *a*), which becomes hierarchical as more complex rules are acquired (e.g. blends, as in *ship*, *church*, and—ng endings, as in r*ung*, b*anging*). Later a visual strategy is used to spell irregular words that cannot be spelt using a phonic method. This delay in recourse to a visual procedure for irregular words could be explained by the time required to build up a store of words that have a visually familiar appearance. Adult spellers tend to rely heavily on this strategy, using word associations rather than decoding strategies to spell unfamiliar words. The use of visual strategies, where stronger emphasis is placed on the orthographic or conventional written representation of words rather than sound-symbol correspondences, in both reading and spelling, may bring the transfer between the two much closer.

Marsh et al. (1980) identified a number of strategies that are taught to children learning to read and are likely to have an impact on spelling. The first involves substitution or 'linguistic guessing', where the child substitutes a known word for an unknown one, based on meaning and grammatical context (e.g. 'I see a pile (heap) of porridge'). 'Instead of decoding words they search for an analogous word and pronounce the unfamiliar word by analogy to the known word' (Marsh et al., 1980, p.343-344). Younger children, although capable of analogical reasoning (Sternberg, 1977) do not use this strategy, probably because they do not have a sufficient store of words in memory. Initially there may be no relationship between the pattern of letters in the printed and the substituted word, but at a later stage in reading development, the child may rely on cues such as first or last letters to form the substitution. The initial word substitution strategy will be of no use in developing spelling skills and the later partial substitution strategy will be of little use, as spelling requires that every letter in a word be presented correctly. Frith (1980), in a study of unexpected spelling problems, reinforced this conclusion when she stated that 'partial clues are an insufficient basis to form output programs that generate the correct letter-by-letter sequence of words. If minimal cues are used for word recognition, the reading process is highly efficient; however, only limited information becomes available through it to the spelling process' (p.515).

A second developmental reading strategy used by children may transfer to spelling. By the end of the first year of reading instruction, children are usually being taught decoding or phonic strategies, i.e. learning to break down a word into regular units in order to read it cor-

rectly. Marsh et al. (1980) split these decoding strategies into two types. The first they describe as a ***sequential decoding strategy*** in which spelling-to-sound correspondences are treated as invariant and are processed serially from left to right (e.g. (cat) is 'c-a-t': 'cat'). This strategy can help in several ways. For example, the child must process the whole word and so can build up a visual representation of the word in memory. In addition, the spelling-to-sound correspondences being learnt can aid in the reading and spelling of unknown words. However, these symbol-sound associations are not always reversible from sound to symbol (e.g. when we hear 'kit', do we spell it 'cit' or 'kit'?) and the spelling of these words will have to be taught. Moreover, some children cannot make such reversals automatically and they will have to be taught this skill. The other decoding strategy described by Marsh et al. as ***hierarchical decoding*** involves the use of rules such as the silent *e* marker or the *ck* rule. Once again, these are required for both reading and spelling, but need to be taught for spelling as well as reading since all children will not automatically transfer the use of these rules from one curriculum area to the other.

It would appear then, that there is a considerable transfer of skills from reading to spelling, particularly after the initial sight word stage. This creates a strong argument for some delay in the introduction of spelling, since, according to Marsh et al. (1980) the first stage of development of spelling corresponds to the second stage of reading; alternatively, an argument could be made for beginning reading instruction with decoding skills or phonics instruction.

> In this sense, reading a word correctly and writing a word correctly ideally should be two sides of the same coin, and learning to read should imply learning to spell. However, such a close relationship can only be obtained if the reading process itself mimics the spelling process (Frith, 1980, p.515).

2. The Developmental Stages in Spelling

The cognitive developmental model of spelling strategies outlined above is supported by research evidence from various sources. Many of these were developed from Read's (1971) study on the 'invented spelling' used by pre-school children who could not yet read. Both Read (1971) and Carol Chomsky (1971, 1978) demonstrated that very young children who had not yet been formally taught to read and so were not familiar with conventional sound-symbol correspondence conventions used a phonetic strategy to spell words, after selecting letters to represent sounds in terms of articulatory features of the sounds on the lips (for example, grl: girl, yt: while, dot: don't) or by use of the alphabetic name of a letter (for example, fes: fish, ceme: come). Read (1971) reported that the children in his study often had difficulty reading their own writing, which supported the assertion that different strategies were being used to read and to spell.

Following Read's study, a number of researchers, looking at school-age children, have identified and described developmental stages of young children's spelling ability based both on a study of their errors (Beers & Henderson, 1977; Gentry, 1978, 1982, 1984; Templeton, 1979) and on their correct responses (Marsh et al. 1980). From this work, the term 'developmental spelling' has emerged.

> Developmental spellings are spelling patterns resulting from different strategies that children use at various stages of cognitive development. These patterns or error types change as changes occur in the state of the child's knowledge of English orthography. Though some of the error types may seem unusual, they change systematically and predictably. The errors change qualitatively over time as experiences with print effect changes in the child's view of how English spelling works (Gentry, 1984, p.13).

The stages have been described in basically the same way by a number of authors but with slight variations. The variations proposed by Marsh et al. (1980), Bookman (1984), Gentry

(1982) and Frith (1980) are useful to discuss. These stages are represented diagramatically in Figure 1.

There is a high level of agreement evident in the stages outlined here. Only Gentry and Bookman include a preliminary stage (precommunicative or prephonemic respectively), but all four lists describe the first stage of spelling as involving a phonemic coding strategy. However, there is some variation in the transitional stage that precedes the final stage of correct spelling. All but Gentry consider this to be the level at which children begin to use the rules of spelling. Gentry, in contrast, emphasizes the role of visual memory for conventional spelling patterns in spelling at this stage of development. The role of analogy and visual memory are emphasized in the final, correct stage of 'developmental spelling'.

3. Types of spelling problems

a) Common spelling problems

The developmental view of spelling outlined above was primarily derived from studies of good and bad spellers and the errors they make. These studies provide some data on the types of spelling problems that children often demonstrate. For example, Barron (1980) tested the spelling skills of good and poor readers aged from 9 to 12 years. He found that both groups used a phonological strategy to spell regular words. However, the good readers also used a visual approach in reading and spelling, according to need. Barron concluded that reliance on one strategy without recourse to the other could disadvantage a child. Further evidence to support Barron's model is provided by Frith (1980) who reported that children who were good readers but poor spellers used a phonetic spelling strategy consistently without attention to the precise letter construction of the word. They tended to consistently mis-spell phonetically irregular words. In contrast, the children who were both poor readers and poor spellers tended to have difficulty with both phonological and visual strategies, mis-spelling phonetically regular and irregular words with equal frequency. Frith suggested that these children's problems could have been associated with a language deficit which interfered with successful use of sound-symbol rules.

b) Unexpected spelling problems

Frith's (1980) research was concerned with a group of what she termed 'unexpected spelling problems.' These were people who could read very well but were seriously handicapped by a spelling problem and those who had overcome a reading problem but still retained a persistent spelling problem. In an analysis of errors made by this group of people, good readers/poor spellers along with two other groups, good readers/good spellers and poor readers/poor spellers, Frith observed that the majority of spelling errors made were phonemic mis-spellings and fell into the third of Frith's stages, that of choosing the conventionally correct graphemes.

> 'It seems that they are concerned to retain the correct sound of a word even if they do not retain the correct spelling. They can use sound-to-letter correspondence rules, but they do not seem to know the precise letter-by-letter structure of a word' (Frith, 1980, p.500).

Frith hypothesised that reading strategy differences between good readers/good spellers and good readers/poor spellers could result in spelling failure at the final or correct stage of spelling (see Figure 1). She found through a series of experiments with the reading of nonsense words that the first group read by using *full cues*; that is, taking account of all cues available in a word, including its letter-by-letter structure. Reading by full cues would entail attention to sound and would also provide a good basis for acquiring spelling skills.

Figure 1. Outline of the developmental stages in spelling acquisition

Marsh, Freidman, Welch	*Gentry (1984)*	*Bookman (1984)*	*Frith (1980)*
	Precommunicative spelling. Spellers randomly string together letters of the alphabet without regard to letter-sound correspondence. Example: OPSPO = eagle; RTAT = eighty.	Prephonemic	
	Semiphonetic spelling. Letters represent sounds but only some of the sounds are represented. Example: E = eagle; A = eighty.		
simple ***sequential encoding*** strategy	Phonetic spelling Words are spelled as they sound. The speller represents all of the phonemes in a word though spellings may be unconventional. Example: EGL = eagle; ATE = eighty.	***Literal phonemic***, using a sequential phonetic encoding strategy.	Correct analysis of speech sounds, i.e. the ***approximate phonemes*** are derived.
hierarhical encoding strategy involving the use of rules conditional on intra-word environment.	***Transitional spelling.*** A visual memory of spelling patterns is apparent. Spellings exhibit conventions of English orthography: vowels in every syllable, e-marker and vowel digraph patterns, correctly spelled inflectional endings, and frequent English letter sequences. Example: EGUL = eagle; EIGHTEE = eighty.	***Rule governed***, with use of morphological and/or orthographic rules in an hierarchical encoding strategy	***phoneme*** is ***grapheme*** conversion by appropriate rules, or possibly, by analogies rather than rules
strategy of spelling unknown words by ***analogy*** to the spellings of already known words.	***Correct spelling.*** The word is spelled correctly.	***Correct*** stage involves visual memory and analogy, with the whole word conceived as a lexical unit.	conventionally ***correct graphemes*** selected out of all the phonetically plausible graphemes (implied by phonetic mis-spelling).

Frith also found that the poor spellers were reading by *partial cues*, capitalising on the redundancy present in written language, in that many elements in words are not essential to their recognition. Even though both groups had similar reading and word recognition scores, the poor spellers were unable to use analogy or a complete letter-by-letter analysis in order to read the nonsense words. Or, as Nelson (1980) observed; the children who were good readers but poor spellers appeared to have developed the phonemic analysis aspects of spelling at a normal rate, but were unable to remember the correct graphemic representation of familiar words.

c) The learning disabled speller

While Frith's good readers/poor spellers were failing at the last stage of spelling, the third group of people she studied, the poor readers/poor spellers, were not only failing at this later stage but also at the earlier sound-to-symbol stage. Some of their non-phonetic errors occurred even at the earliest stage, with the incorrect phoneme being derived from the speech sound (e.g. meet for meat). These types of errors would be expected during the early acquisition of spelling. In fact, developmental studies with learning disabled children demonstrated that the spelling abilities of learning disabled populations followed normal developmental patterns, though at a delayed rate (Gerber & Hall, 1982; Poplin, 1983). Even intermediate level learning disabled children had spelling error patterns like those of their younger non-disabled counterparts (Carpenter, 1983; Gentry, 1984).

However, Nelson (1980) makes an observation that much of the data collected in studies of the spelling errors of the learning disabled used inappropriate procedures. For example, good and poor spellers of the same age were often given the same spelling lists to attempt. Not unexpectedly, the poor spellers, when asked to spell words far beyond their capabilities and spelling ages, produced grossly mis-spelled errors. During the early acquisition stages, even good spellers would produce gross errors when asked to spell words beyond their capability. Nelson tested three of the most frequently occurring error categories attributed to 'developmental dyslexia'. These were:

(i) order errors, which may be considered to reflect sequencing problems;

(ii) phonetically inaccurate errors, which may be considered to reflect auditory-linguistic problems; and

(iii) orthographically illegal errors, which may be considered to reflect visual-linguistic problems.

By comparing dyslexic students and younger children with the same spelling ages, Nelson found that a sample of dyslexic children was not significantly different from a group of matched controls in the number of order errors made and also that there were no individual children in the group who made more errors of this type than the others. She also showed that the number of phonetically inaccurate errors made by these children were no more than expected in view of their overall level of spelling achievement and that there was only a non-significant trend for the dyslexic children to produce more orthographically illegal errors than their controls.

Nelson (1980) went on to hypothesize from the results of her study that children with a spelling difficulty only, had a specific retrieval rather than a learning problem, in contrast to the reading-and-spelling retarded children who appeared to have a learning rather than a retrieval problem. This hypothesis would gain support from the research of Frith (1980) who found that the subjects who had only a spelling problem were unsuccessful in the final stage of acquisition, when analogy or retrieval of the details of words was required for correct spelling, whereas the dyslexic subjects had errors in the early phoneme-grapheme and rule-governed stages which required learning strategies to be established.

Hall (1984) summarized the findings of seven studies carried out with Gerber which suggested that learning disabled students:

1. progress through the same, relatively invariant levels of spelling ability as their normally achieving (NA) peers.
2. appear delayed in comparison to their NA peers (no logical grounds were found for predicting that they would catch up at some later age).
3. produce errors that could be characterized as logical, systematic, consistent, and strategic, while showing little or no evidence of errors that could be described as random or deviant.
4. possess, but fail to access spontaneously or to use efficiently, the considerable experimental and rule governed information they have about spelling.
5. given sufficient pre-training skills, can be trained in self-monitoring routines that result in higher quality spelling attempts in comparison with untrained students (Hall, 1984, p.71-72).

These results seem to summarize the present state of knowledge concerning the spelling problems of the learning disabled. The spelling errors they make are developmentally normal. However, these children may not make that final leap to correct spelling of words that are not phonetic or rule governed and require analogy or retrieval from semantic memory. However, given the correct early training with phonemic and decoding strategies, together with self monitoring techniques, they can improve their spelling performance.

3. Remedial Programs for Spelling Problems

> There is no question that, for most children, reading is a skill which needs carefully planned teaching, and the less favoured the child, the more carefully programmed this needs to be. This is because, in reading, prediction depends on linguistic competence, and prediction confirms or refutes what the child is sounding out as he reads. This ability to predict what is coming next is the privilege of the linguistically favoured child, and he is therefore not wholly dependent on phonic information. The child who is less favoured can be taught to read by being given a completely dependable phonic system, and for him the sense of what he is reading confirms or refutes his phonic sounding out.
>
> The child who is less favoured needs a systematically planned program even more in spelling than in reading, since he may well have missed the early exposure to, and playing with, words which contributes to good visual perception of word form. (Peters, 1975, p.5).

While it seems to be accepted that the learning disabled child moves through the same developmental stages in spelling as the normal achieving child, there is a danger in thinking that he will move through these stages automatically. In fact, the normal achieving child passes through these stages as his knowledge of English orthography grows and this growth usually occurs with teaching. Some children may be gifted enough to extract and comprehend sound-symbol correspondences and orthographic rules from their experiences with reading; however, learning disabled children, in particular, need to be taught these things in a tightly controlled systematic manner before they can begin to master the orthographic structure of our language. As Hall (1984) states:

> Acquisition of spelling ability requires specific information about phonology, phonemic segmentation, sound-symbol correspondence, and specific orthographic conventions (i.e. rules). Of equal importance to solving spelling problems was sight word knowledge, knowledge of spelling pattern invariances (e.g. at-words, ate-words, etc.) and the ability to retrieve data-driven or hypothesis-driven information according to a strategic plan (p.71)

Remedial programs should aim to incorporate all of these skills, starting with the phonological knowledge. Some children may be gifted enough to extract and comprehend

sound-symbol correspondences and orthographic rules from their experiences with reading; however learning disabled children, in particular, need to be taught these, together with, finally, retrieval or analogy skills, including a study of morphemic families or the lexical spelling of words. This would result in the correct spelling of the more difficulty words in our vocabulary, and sight words in particular.

There are, however, a number of ways in which learning disabled children can be assisted to achieve these objectives on their way to spelling success. These include training of visual memory for words, training for transfer and generalisation skills, reduction in the number of words taught at one time and the provision of adequate opportunities for practice of spelling skills. A number of these strategies will be considered in the following discussion.

The role of *visual memory* in the spelling process is crucial, both in the spelling of sight words and in final developmental stage of correct spelling:

> What in fact happens with most literate adults is that when they are faced with spelling a word about which they are uncertain, they write it down to see if it looks right. In other words they use visual reference. Vision is our preferred sense. We acquire information by looking, and it is only through visual familiarity with the written language that we learn the probability of certain letters occurring together, in other words, serial probability (Peters, 1975, p.7).

In order for the learning disabled child to reach a stage where visual memory skills are used for spelling, training needs to start early, before high frequency spelling patterns are mislearned. One way that has been shown to be successful in helping visual memory is through the use of imitation and modelling. Several studies (e.g. Kauffman, Hallahan, Haas, Braine & Boren, 1978; Nulman & Gerber, 1984) have demonstrated that the imitation of children's errors, followed directly by modelling of the correct response in order to compare and contrast their errors with correct spelling, was successful in improving both current performance and recall, in learning disabled and mildly retarded students.

Kauffman et al. (1978) reported that this procedure was particularly effective where regular phonetic rules did not apply and the child had to rely primarily on visual memory. However, in the experiment referred to above, Kauffman et al. compared a modelling only teaching phase (e.g. Child: fes, Teacher: fish) with an imitation and modelling-teaching phase (e.g. Child: fes, Teacher: fes, fish) with the teaching phases alternating weekly. While the imitation and modelling teaching phase showed significant improvements, it was noted that the children's own responses in the spelling task were erased by the teacher before the modelling-only or imitation and modelling was carried out. This means that in the modelling-only phase, the children could not compare their errors with the correct spelling. It may have been sufficient to have given the correct model below the incorrect responses and to draw the children's attention to the differences between them. However, this has not been tested experimentally. Meanwhile, there seems to be agreement that imitation of children's errors and modelling the correct response do have some effect on their ability to use visual memory for recall.

Finally, in considering the place of visual memory skills in spelling, the very important role of morphemic units should also be recognized. As Venezky (1970) says, because English orthography is both phonemically and morphemically based, teaching in both reading and spelling should go beyond phonemic rules to morphemic patterns such as: hear, hears; hearing; heard. Venezky argues that spelling of the apparently irregular word *heard* is much easier when it can be associated with its root word *hear*. Carol Chomsky (1970) also supports this viewpoint. After a discussion of the relationship between reading, writing and phonology, where she points out that while English spelling often appears to be inconsis-

tent, it in fact generally conforms to an underlying system of abstract meaning, Chomsky goes on to suggest:

> The general conclusions to be derived from the view of the orthography presented here is that spelling, far more often than it seems from a purely phonetic standpoint, does make sense. Many spelling errors could be avoided if the writer developed the habit of looking for regularities that underlie related words when in doubt. This is part of the strategy used by good spellers as a matter of course. For the child who spells poorly it is far more productive to learn how to look for these regularities than simply to memorize the spellings of words as isolated examples. Providing him with a strategy based on the realities of the language is clearly the best way to equip him to deal with new examples on his own.
> (Chomsky, 1970, p.308-9).

Laurita (1985) supports this view, asserting that learning to spell successfully will not only involve learning the association between individual letters and sound, as well as learning to distinguish between consonants and, more importantly, vowels, which are an essential component of intelligible words, written or spoken. In addition, the learner must begin to recognize simple words or roots (i.e. 'sequences of letters containing one, and only one, pronounced and graphemically recognizable vowel element, as in *act, late, coast, count* and *void*), together with the increments that expand the meaning of such words, including those indicating tense, person, number, gender and case (e.g. act*ing*, soo*ner*, hat*s*) together with affixes that affect the meaning of words (e.g. *de*fusing, *re*appointing). So, following a developmental stage model, it may be argued that children need to move through phonemic patterning and then to morphemic patterning, towards final mastery in spelling.

The second way in which the learning disabled child can be helped is in training for transfer or generalization skills. Peters (1975) argued that generalization of letter sequences, through familiarity with letter patterns that recut frequently in written language, did not always happen naturally, as a result of maturation and in increase in the child's cognitive level of development. The ability to generalize, at a mechanical level, probably occurred automatically in good spellers, but poor spellers had to be made aware of the mechanisms of generalization before it became automatic. A series of studies conducted by Gerber (1984a) found that with efficient feedback, in the form of imitation and modelling, together with the provision of sufficient time to learn, in the form of repeated trials, children were able to transfer the skills they had learned using one spelling list to another list of similarly spelled and rhyming words.

The issue of *sufficient time to learn* also seems to be crucial with learning disabled children. Gettinger and White (1979) found that the atypical learner needs sufficient time and opportunity to learn. This was often not provided in the spelling programs used in most schools. As Gerber and Lydiatt stated, 'teachers spend relatively little time teaching spelling, relying instead on commercial materials to select words, organize practice, pace instruction and test mastery. The result for LD and other low achieving students is disastrous. When time to learn is limited, variability in achievement is probable, and failure to learn for some is guaranteed' (Gerber & Lydiatt, 1984, p.6-7).

Another way in which children can be helped to gain generalization skills is through the use of word family patterns. The learning disabled child needs to learn that a word like 'drink' has a similar spelling pattern to other words with the same sound like 'pink'. 'sink' and 'mink' (Johnson, Langford & Quorn, 1981). While the normal achieving speller is often able to infer these specific speech-sound-symbol generalizations, the learning disabled child needs to have these regularities in spelling taught in a systematic way, with their attention drawn to such regularities each time they occur (Gettinger, Bryant & Fayne, 1982).

When considering the issue of transfer in relation to spelling for the learning disabled, it is

important to consider not only the transfer of knowledge from word to word, but also the transfer of the skill of spelling to other situations outside the spelling lesson, for example, written expression. 'Instruction should, therefore, also incorporate opportunities for children to utilize spelling skills within a sentence context to ensure positive transfer to fluent writing' (Gettinger, 1984, p.45). This can be done effectively through using activity sheets incorporating such things as cloze procedures (e.g. (I . . . the cake Mum made; at, ate), using the words that the child is learning at the time, or a sequence for the development of self-generated sentences (e.g. write a short sentence from the word *dish*).

The third consideration that would help learning disabled spellers would be the ***reduction of the size of units*** that they are expected to learn at any one time. 'It has been suggested that an excessive number of spelling words to be learned at any one time can readily overload the processing abilities of the LD child' (Gettinger, 1984, p.43). A number of studies have found that learning disabled children performed much better in the weekly spelling tests if they were only introduced to a minimal number of words each day and in some instances tested daily on those words and on the accumulated total at the end of the week (Reith, et al., 1974; Bryant, Drabin & Gettinger, 1981). Initially, the number of words taught daily could be three or four, depending on whether the words are irregular or regular and whether or not they follow a phonic generalization. The list could be increased to 10 or perhaps 20 if the words being learnt follow word family patterns.

The fourth consideration to make when teaching spelling is the use of ***sufficient and distributed practice***. It is generally accepted that, like all children, the learning disabled need sufficient practice in order to gain mastery (Bloom, 1976; Haring & Bateman, 1977; Otto & Smith, 1980). Gettinger (1984) however also feels that this practice should be distributed over time since children who demonstrate inadequate spelling skills may be particularly susceptible to the effects of fatigue and interference during instruction and appear to benefit the most from practice that is spread across several days of instruction. There also needs to be a constant review of words that have been taught and mastered. Children will not be able to retrieve words from memory efficiently if they have not been used very often. 'Systematic review strengthens skill acquisition and helps to make LD children more automatic with their learned spelling skills' (Bryant, 1980, p.44).

Reith, Polsgrove and Eckert (1984) summarized the five major characteristics of an effective remedial spelling program as follows:

1. As studies suggest that most handicapped children do not profit demonstrably from incidental teaching. Spelling programs should teach direct content.
2. Spelling instruction should be individually tailored to the children's instructional needs.
3. Remedial instruction should involve frequent evaluation.
4. Spelling remediation should involve flexible use of a wide variety of techniques based upon analysis of the student's spelling performance.
5. Remedial spelling instruction should consider the attitudes of both the student and teacher.

SUGGESTED REMEDIAL PROGRAM

In view of the findings summarized above, two types of program appear to be needed: first, one to suit young learning disabled children who are only just beginning to learn the conventions of spelling and secondly, one suitable for older learning disabled children who have grasped some elements of spelling, or for those children who are good readers but have a bad spelling problem.

1. A Beginning Spelling Program

A spelling program for a beginner should contain the following elements and procedures:

(a) Sequenced lists of words using word family patterns to aid generalization or transfer should be provided. While these lists should start with words involving the teaching of sound-symbol correspondences and high frequency spelling patterns, they should also progress to different vowel pairs, teaching the children to make appropriate choices between probable vowel spellings. Common orthographic rules also need to be included.

(b) Opportunities need to be made for daily teaching and testing of words from these lists.

(c) Immediate and efficient feedback should be given on any spelling errors.

(d) The number of words learnt per day needs to be controlled to match the child's capabilities.

(e) A test-study-test procedure should be used with each set of new words. The initial test can help the teacher decide on the number of words to be introduced at any one time. The list of words can be given but halted once the child has made three or four mistakes. The child then only has to learn these few words and his processing abilities will not be overloaded.

(f) The teaching procedure used can vary, but should include phonics, imitation and modelling procedures for the correction of words, together with writing the word.

(g) There should be plenty of practice given with the target words in isolation, in sentences and written expression.

(h) Above all else, time should be allowed for learning to take place.

2. A More Advanced Program

While many procedures need to be the same for more advanced children who have partial knowledge of the spelling system, as for beginning spellers, there are a few special considerations to be made when planning the formers' remedial program.

(a) It will not be necessary to follow a step-by-step sequence, as with the beginning learner. Some lists from a beginning program could be used but they should only be selected if they include words which the children have demonstrated, through testing or their own written expression, that they cannot spell correctly.

(b) The teacher should construct individual lists using words each child needs to know. Make a daily list of three to five words that were incorrect in the child's written work. Teach the necessary phonics, phonic rules, word structure information or analogic reasoning.

(c) A second list to test for generalization needs to be generated from the first, using similar words based on the orthographic structures taught. This second list could be given after two days or the end of the week, depending on the number of structures that needed teaching.

(d) The number of days spent learning each list will depend on the needs of each child. Give sufficient trials for the words to be learned and test them each day.

(e) The teaching procedures should include not only phonics, phonic rules, and word structure information but mnemonic devices, analogical reasoning, which would incorporate studies of the lexical spelling of words or 'morphemic families', proofreading at a whole-word level, generating alternative spellings using different vowel pairs, and the ability to make choices between alternative spellings using visual skills.

A teaching program, based on these principles, is currently being trialled in a special education classroom that provides intensive remedial programs for children who have experienced problems in learning within a regular infants level classroom. Early results suggest that the program is effective for teaching spelling to children with learning problems. Such a program based on cognitive and developmental principles, could provide a means for ensuring that all children, including those who are known to have learning problems, acquire age appropriate skills in spelling.

Chapter 12

TEACHING HANDWRITING SKILLS TO PRIMARY SCHOOL CHILDREN

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INTRODUCTION

People communicate their needs in many ways, but perhaps two of the most predominant forms are the oral and written modes. In the last few decades the number of options available for communicating through variations of the written mode has increased rapidly with the development of typewriters and word processors. However, the predominant form and first stage of most printed communication is still that of handwriting and, in schools particularly, children's ability to communicate is evaluated largely through a handwritten mode. A student whose handwriting is untidy, ill-formed or over-written may receive lower marks than would have been given if the same answers had been written in a good legible penmanship (Jarman 1981). This chapter is concerned with the issue of handwriting in a remedial context.

Most of the children enrolled in the Primary class at the Special Education Centre have handwriting difficulties, in addition to their other problems. For example, according to informal assessments reported by teachers in referrals of 26 children between 1979 and 1982, the handwriting of 24 was poorer than that of their peers: 8 were described as being about six months behind, 12 were one year behind and 6 were more than one year behind. Discussions with teachers of these children revealed that there was an increase in the number of children experiencing problems in handwriting as they reached the upper primary grades. Often when such children reached Year 7 they reverted to manuscript writing in an effort to cope with the increasing amount of material that they needed to write quickly.

There may be several explanations for the handwriting difficulties experienced by primary-aged children. The modified cursive style taught in many N.S.W. schools, is not a good vehicle for promoting handwriting fluency: for example, in writing, *for*, *of* or *your* the pencil has to be taken off the page for *f* and *y* and as a result, the rest of the word becomes disjointed. Further difficulties are imposed on the children's acquisition of handwriting by pedagogical practices (NSW Department of Education, 1981a) which have required them to unlearn the manuscript style formation they have mastered up to Year 3. Comparisons of manuscript and modified cursive show that not only do the formations change, but slope, starting or finishing points and the point at which a letter is crossed can also differ. The rationale underlying the need for such re-learning exercises was the belief that Infants grade children's acquisition of early reading and writing skills will be aided if there is consistency between their handwriting and the print in their early readers (Jarman, 1981).

However, this assumption may be questioned, since examples of children's work illustrate the difficulties that many experience in handwriting when they are required to change style. Even if children can form the letters correctly, they may find other aspects of the new style difficult when they are concentrating on the meaning of what they are trying to write, rather than on where to start and how to form specific letter shapes. Apparently children see handwriting as a skill separate from what they want to communicate and this is reflected in the common occurrence that, while some children write correctly in their cursive copybook, they have difficulty in forming the same letters in their other work. For many children progressing through school, handwriting does improve from exposure to current teaching practices. However, other children need a program of highly structured teaching of this skill in order to acquire the same degree of competence.

NSW SYLLABUS FOR SPELLING AND HANDWRITING

The N.S.W. Syllabus for Spelling and Handwriting (NSW Department of Education, 1979a) presented general considerations for teaching manuscript writing to Infants children, and modified cursive to Primary children. According to the syllabus, the 'essential characteristics' of good handwriting were:

a) legibility with some beauty of form
b) fluency, rhythm and reasonable speed (NSW Department of Education 1979a, p.56)

The Syllabus also stated that the teacher would realise these aims only with 'carefully planned instruction and regular, methodical supervision at all levels' (p.56). However, no explicit criteria were presented for helping teachers to evaluate handwriting programs, though four statements extracted from the Syllabus provide some guide for assessing method and materials that could be used in teaching this skill. These statements were:

(1) The major emphasis should be on the functional and creative purposes of writing (p.43).
(2) To establish automatically correct habits many repetitions are necessary. Provision must be made for regular, systematic practice of words and letters to eliminate errors and improve performance. It is advisable to concentrate on one difficulty at a time (p.44).
(3) Children who show a high degree of efficiency in writing do not benefit from unnecessary practice with the less able children, as this may lead to boredom and the development of poor attitudes. To enable those more capable children to proceed at their own rate, suitable enrichment activities should be programmed (p.43).
(4) From the first the children should be encouraged and assisted to criticise their own efforts and to improve them. (p.44).

In short, handwriting was considered to be a functional and creative skill which needed to be practised to promote legibility and fluency. Some children needed more practice than others and efficient writers could become bored and careless if required to practise as much as poor writers. All children needed to be taught to evaluate their own handwriting and be guided in its improvement.

COPYBOOKS

The Modified Cursive Copybooks (Kinsella, 1969) have been widely used in N.S.W. schools as a tool for developing handwriting. According to Hendricks (1976), a copybook is meant to be used for practice and reinforcement of a skill the child has already acquired (see also Jarman, 1981). The Kinsella Copybooks provided examples of shapes, letters, words and sentences for children to copy. Three sets of practice lines were printed below

each line for examples and children were encouraged to assess their own handwriting and record their mark in a box in the corner of the page. Instructions were provided, but there was no rationale accompanying the copybooks, and to use them most effectively, teachers needed to evolve their own procedures. Observations of children using copybooks for handwriting and subsequent analysis of handwriting in copybooks, suggested that there were four main problems associated with their use:

a) letter formation deteriorated as boredom set in.
b) if not corrected, an initial mistake would be compounded by the end of fifteen repetitions (typical number of repetitions per line).
c) the child worked only from a near-point model and was not tested to see if he could write the letter from memory.
d) letters that had been correctly formed in the copybooks were not necessarily written correctly in other bookwork.

The Kinsella Copybooks appeared to have been designed to meet the needs of children with poor handwriting, because of the amount of practice space set out below each line of models (a set of three practice lines), yet in many schools these books constituted the total handwriting program for all pupils. The books did not suggest any objectives beyond the standard implicit in the models the children were to copy. While motivational advice and some directions were provided for each page in the end covers of the books, there was little in the nature of direct procedures for realising the 'essential characteristics' of good handwriting as stated in the Syllabus (p.56).

With regard to the four statements cited earlier from the N.S.W. Syllabus (1979a), the Kinsella Copybooks were not as compatible as could be expected from a program used so widely in N.S.W. schools. In particular:

1. Statement (1), which emphasised the function of writing as a means of communication and creativity, was reflected in a limited manner only in these books. While some of the sentences to be copied contained interesting information, they were nevertheless, not generated by the children themselves, and the child copying a sentence did not actually need to attend to its meaning in order to copy it correctly. Poor readers did not always know what they were writing and the marking emphasis on correct copying contributed to this difficulty.
2. The Kinsella Copybooks were compatible with Statement (2), in that provision was made for repetition, but the practice of using repetitious material to teach a skill has been questioned by Gay and Sharpley (1980), who found that three correct trials accelerated learning of letter shapes. Trap, Milner-Davis, Joseph and Cooper (1978) found that practising letters that had not been previously trained did not 'support the adage, 'practice makes perfect' '(p.32). They concluded that in order to develop competency, it was necessary to practise successively improvising letter formations, which required continual assessment and training. The Kinsella Copybooks did not suggest a rationale for systematic practice and the Syllabus did not provide more precise guidelines for desirable repetition in order to establish 'automatically correct habits' (p.4). In addition, with regard to Statement (3), the Copybooks provided no extension exercises for children who could already write legibly and fluently.

Some concessions to evaluation (refer to Statement (4)) had been made in the layout of the Kinsella books: as noted earlier, a small box was printed in the lower right hand corner of each page for recording marks from both student and teacher evaluation. The marks a student received were entered onto a grid found at the back of the book. Although children could identify which letter they copied most accurately, this did not mean that they thereby internalised the features of that letter to produce next time they wrote it in another setting. Graham and Miller (1979) discussed the need for student self-evaluation but warn that self-evaluation procedures need to be taught. Several methods of self-evaluation were researched by Trap et al. (1978). Although the findings varied according to the individual

student, a combination of 'talking through' the formation and using a plastic overlay to evaluate the student's own work was found to produce the greatest amount of improvement in handwriting.

In the light of the inconsistencies discussed above with regard to the Kinsella Copybooks, it was clear that what was needed was a program that fully incorporated the points raised in the Syllabus in order to teach children to write creatively and efficiently. Part of the work of the Primary classroom at the Macquarie University Special Education Centre (MUSEC) had been to identify areas of need in the teaching/learning of basic skills and to develop curriculum materials, complete with instructional procedures, to meet such needs. The MUSEC Cursive Handwriting Program was designed to give children control of their handwriting. It provided exercises which ranged from teacher-directed to self-monitored, from near-point to far-point models of handwriting and from external to internal evaluation of competence. The Program, based on the four statements extracted from the NSW Department of Education Syllabus and operationalised through a functionally consistent sequence of skills, is described in the following section of this paper. Results are reported from use of the program with three children from the Primary class who had been experiencing handwriting problems.

THE WRITING PROGRAM

1. Objectives

The objectives of the MUSEC Modified Cursive Writing Program reflecting the statements contained in the Syllabus, were as follows:

1. to enable the child to internalise the learning process by the use of tapes which 'talk through' the steps to form a given letter;
2. to emphasise the similarities of letter forms by grouping these letters in a teaching unit;
3. to reduce the amount of learning by pointing out the similarities and building on these, e.g. *i* is a one letter unit, *u* is like two *i*'s, and *w* is like *u* with another *i* added on;
4. to get the children to evaluate the correctness of their handwriting by the use of plastic overlays that show up the difference between the model and the child's own attempt at the letter;
5. to get the children to correct the problems they have found and give themselves full marks when the letter is correctly formed;
6. to reinforce correct formation of letters immediately by not making the children do unnecessary practice on letters they can already form;
7. to develop handwriting in a meaningful context by testing at the end of each letter group. The learnt letters are embedded in a written message;
8. to concentrate on one learning task at a time by demonstrating mastery on that teaching unit item before moving onto more complex material;
9. to check that a given skill within a teaching unit has been mastered fluently as well as accurately by getting the children to demonstrate on different material, e.g. in creative writing;
10. To monitor maintenance and transfer of handwriting skills to other bookwork as each learning task is completed.

The writing program was designed to meet two needs: either to teach modified cursive handwriting to the whole class as part of the normal teaching program, or to provide a remedial program for an individual child. It incorporated a structured, sequential approach to teaching modified cursive which provided a systematic procedure for teaching handwriting, by allowing for monitoring of each child's progress and adaptation to suit individual needs. The program included both diagnostic materials and a teaching sequence for instruction in writing letter shapes correctly and fluently.

2. Assessment Materials

The screening test was designed for use both as a pre—and post-test and as a diagnostic instrument to locate individual problems in children who had already been exposed to cursive writing. Each child's progress on the program could be monitored through a brief test that was included at the end of each section of the program. Plastic overlays (overhead transparencies) were also provided for use by the teacher to demonstrate a skill and secondly for individual children to check their own work. Self-evaluation procedures were an important component of the program.

3. Teaching Materials

Teaching materials comprised a modified cursive writing booklet, that included practice and test sheets, overhead transparencies, an audio-cassette tape which could be used for individual instruction, providing complete teaching and evaluation instructions for each single letter shape. The tape provided a model for the student to learn to 'talk through' or self monitor the actions required to form each letter. This self-instructional procedure was an important aspect of the Program.

The writing sequence itself was organized around groups of letters that had similar written formation. For example, *i*, *u*, and *w* were grouped together because the first two strokes of each letter were written the same way. Thus, if a child had a problem forming *w*, he/she needed to work through the *i* and *u* section of the program in addition to the *w* section. This was important because *i* was considered a prerequisite skill for writing *u* and *w*. In addition, each letter shape in a given section reinforced the skills necessary for writing the other letters in that group. Where possible, the simplest letter was presented first in each group of letters, followed by a demonstration of the steps required in order to change that letter to make the other letters in the group, from a sequence from the simplest to the most difficult. The groups of letters were also arranged in order of difficulty and in some instances, in terms of relative frequency of use. A copy of the sequence of skills incorporated in the program is appended (see Appendix A).

RESULTS

A case study approach will be used to show results obtained from the use of the MUSEC Modified Cursive Writing Program with three children who were experiencing handwriting difficulties.

CASE STUDY 1

Michael, aged 9 years and in Year 4, did not use cursive writing, preferring to print. He was considered to be within the average range of intelligence and was referred to the Centre for marked difficulties in basic skills. He had earlier received daily formal lessons in modified cursive, but used manuscript writing in his other bookwork. He was socially withdrawn and would often cry or vomit when any attention was given to him. His length of stay at the Centre was one year.

Assessment

Samples of Michael's class bookwork were used to assess his handwriting and he was given the MUSEC Screening Test-Handwriting (Primary) (1982). Michael formed the manuscript letters correctly, but the spacing within words was incorrect (e.g. a-mongst)

and he was not sure whether lower case 'j' went on or below the line. He often forgot what he was trying to write because he took a long time deciding where to start some letters (e.g. 'p') and fluency was therefore also a big problem.

Program Procedure

Michael commenced at the beginning of the Program because he had not yet been taught cursive formations. The teacher would explain the terms and procedure to him, then Michael would switch on the cassette tape at the appropriate point for the work sheet to be completed that lesson. When he completed the sheet to his satisfaction, he switched off the tape, he then placed a plastic overlay with models of the particular letter he was learning on top of his work, compared his letter with the model and noted any difficulties. He then gave himself a mark out of ten. If the mark was under eight, further practice was needed on that letter shape. If he could not form the letter correctly within three days, an intervention was implemented. For example, the teacher would draw a large model of the letter on the board and Michael would wipe it out with a brush and water. As he did this he was required to 'talk through' what he was doing, just as he had learnt to do from the tape. If Michael gave himself a mark of 8, 9 or 10 he showed the sheet to the teacher. Three correctly formed examples of the letter were required. Reinforcement consisted of going onto the next page of the program and getting a ring around his name on the Writer of the Week chart. The person with the most rings around his/her work for the week received a merit certificate. The children's work was only compared with their best effort and not against their peers. Once a letter was learned, the children either went on to the next formation or, if they had completed that group of letters, they did the test sheet. On successful completion of the test they went on to practise the same letter on a timed, one minute probe (or practice sheet) to gain fluency (Towle, 1978).

The initial set of letters in the Program was 'i, u, w' and Michael required many interventions before he was able to talk through the letter shapes and write them correctly in all his bookwork. Once he had mastered the letters, he received fluency practice for one minute per day until he reached the grade fluency rate (37-45 letters per minute) (N.S.W. Syllabus for Spelling and Handwriting, 1979). Once he learnt 'a, o, c' he was able to master the 'd, g, q' letter forms on the first trial. By this time Michael was using modified cursive in his bookwork and if his letters were correctly formed he was not required to do extra writing practice. In the rough draft stage of his creative writing he still preferred to print, but the spaces within words had improved. A month later, on the final copy of his creative writing, Michael used cursive writing, though he put into practice only those skills that the program had taught: for example, he did not join the letter shapes, except in a few examples where the join occurred naturally or where he did not have enough room on the paper and had to squeeze the word in. To teach the joins between letters the teacher photocopied Michael's story and used different colours to demonstrate to him the under and over joins. The teacher then rewrote the story in correct formation and Michael copied the story onto a new sheet. He kept the photocopy of his story, with the coloured joins, for future reference.

After three months on the program Michael was consistently using cursive writing for all his bookwork and only needed extra practice when his work evidenced problems within words with a difficult join. He was also working at a fluency rate of 37 words per minute.

CASE STUDY 2

Gary was ten years old and in Year 4 at the time of his enrolment at the Centre. The teacher stated that he was about a year below grade level in basic skills and his writing was vey poor. At that time he did very little written work—most of his responses were oral. Gary had received speech therapy and an intensive remedial reading program at his school and there was a family history of reading problems. He was a gregarious child who would tackle any task he was given with persistence. He suffered from sinus problems and this greatly affected his ability to concentrate on his work.

Assessment

Gary's handwriting was assessed using samples of his class bookwork and MUSEC Screening—Handwriting (Primary) (1982). His formation of manuscript style letters was immature with great variation in the shape of the same letters. There were also many instances of incorrect size of letters and incorrect spacing between words. Gary also made mistakes in copying (e.g. played: plaed). During the cursive writing test, Gary looked up at the chart on the wall to see how to write the letters. Some of his letters were correctly formed, while others were manuscript style. Some joins were correct but it took Gary three minutes to write 'The quick brown fox jumps. . .'

Program Procedure

The materials and procedures used were similar to those used with Michael. However, Gary did not need to start on the first set of letters in the writing sequence and started instead on the two unit letters 'l, t, b', omitting many sections of the program because he reached mastery at the first trial. Supplementary interventions were not necessary as he was vey proud of forming the learnt letter forms correctly in all his other work. The emphasis of Gary's program was to build up his fluency on known letter shapes and each day he did a one minute probe, writing the letter until he reached grade fluency. When Gary could form a letter correctly he also formed most of the joins correctly between the letters. When he did have difficulty with a join he would ask for help and then practise that join until he had mastered it. After four months on the program, Gary began to write modified cursive, at a functional rate, in all his bookwork, taking great pride in his handwriting.

CASE STUDY 3

Stuart, ten years old and in Year 4, had only partial mobility of his right hand due to medical problems as a baby, and was therefore forced to use his left hand for writing. He had received formal cursive writing lessons two or three times a week at his referring school and could form many of his letters correctly, in both manuscript and modified cursive styles. The school counsellor felt that Stuart's problems were due to distractibility, poor manual dexterity, poor coordination and weakness in concrete and abstract reasoning.

Assessment

As with the other two boys, samples of writing in class workbooks and the MUSEC Screening Test—Handwriting (Primary) (1982) were used to pinpoint Stuart's specific handwriting problems. The post-test was administered because Stuart could already form most letters in manuscript style, but was having difficulty converting from print to cursive. The post-test incorporates all letter formations and joins between letters.

Stuart's manuscript letters had a shaky appearance, were often incorrectly placed, their size tended to vary and slope was also inconsistent. The lower case letters were often written as capitals. Space between words differed and actual formation of some letters varied. Position problems arose when he had to copy material, as in 'palyed' for 'played'. Stuart's inadequate knowledge of cursive letter shapes was evident in his fluency test. He had trouble determining how or where to begin writing a letter, and some letters were the wrong size. He also had problems with slopes and some joins.

Program Procedure

Stuart was highly motivated to try to form the letters correctly in all his bookwork since when he did this he did not have to do his structural writing exercises. Each day he did a one-minute timed probe on the letters he could already form correctly. After two months on the program, he had not achieved grade fluency but could keep up with the rest of the group in the Centre classroom and finish all his work. Size, placement and slope of handwriting were improving steadily and at this stage the words no longer looked as shaky as they had on his screening test.

DISCUSSION

The three case studies outlined above were chosen to show the different ways that children can exhibit failure to acquire legibile handwriting. The children all had the same exposure to the handwriting lessons as the other children at their schools who could write legibly, but for them it had not been an easy task to acquire accuracy and fluency in handwriting. However, while it is incorrect to assume that there is something irremediably wrong with the child who cannot demonstrate this skill following exposure to normal teaching procedures, it is equally incorrect to assert that there is something inherently wrong with the methods being used to teach the skill in the regular classroom. The proposition that all children need a carefully sequenced skill-oriented curriculum is not necessarily true either. Most children learn to write legibly within a regular school program. This paper, however, is concerned with the small proportion of children who fail to acquire that skill within a regular class program. The three case studies illustrate that, given the tools to determine individual levels of functioning within a given sequence of skills, their learning potential can be maximised most efficiently with a systematic instructional program. Many influences intrude upon the acquisition of a skill, and past learning experiences and health are just two important factors. The children in the case studies were involved in the program for different periods of time, reflecting these and other factors, such as different learning styles. Motivation, howoever, is crucial. If children see handwriting as a purely academic skill with no application to their needs, they will resist learning. The Syllabus refers to 'the basic concept of writing as meaningful activity' (p.43), and this is crucial to the children's perception of the purpose of the handwriting, and the efficiency with which they acquire the skill.

In the remedial context, if children understand why they need to go through a sequence of skills and how much they already know, they can comprehend the relevance of practice to the final objective of legible, fluent handwriting to improve written communciation. In handwriting, the final product is assessed by others both within and outside the school. Therefore, 'children should be encouraged and assisted to criticise their own efforts and to improve them' (Statement 4—N.S.W. Department of Education, 1979; 44). The teacher's role becomes one of not only understanding the skills that go into the handwriting process, but also of being able to assess just what abilities children bring to the task; then motivating

them to accept the necessity of learning the relevant components in order to achieve that vital skill, which is to communicate in the written mode.

A FINAL COMMENT

As a result of many of the problems which were identified in this paper, a new handwriting policy has been developed for NSW schools. In a base paper on this new policy, prepared at a workshop in 1981, it was recommended that the style favoured in the 1961 policy be abandoned in favour of a *foundation* style. This would replace the 'ball and stick' manuscript and the cursive (or modified cursive) with a single style that could be taught and progressively modified, as children develop. The new style would be based on the early natural drawing movement of children (e.g the ellipse) and would not involve the switch from print to cursive, when children, to a large extent, have to unlearn in primary grades what they learned in their first years at school. In this, the new style should overcome one of the sources of children's difficulties in handwriting identified in this paper.

However, several other problems remain, associated particularly with the question of fluency and with the teaching strategies employed in the Foundation Handwriting copybooks (Nightingale, 1985) that are available for the new style. For example:

1. The loss of fluency in modified cursive, due to disjointed formations within words, is also evident in the foundation style. Examples of some of the inconsistencies are *i* or *i* e.g. *louise* or *Toni*. In some blends it is recommended (Holliday, 1984, p.231) that 'b' is joined (e.g. *bl br*) while in other combinations there is no join, as in *birthday* and *February* . The letter 'p' is another that generally remains unjoined (e.g *April*, *spring*) but under fluency conditions, as seen by distortions with similar formations in modified cursive, would tend to become difficult to read. In fact, the forms that are disjointed in the foundation style (e.g. *yesterday* , *fluffy*) if joined to facilitate fluency (e.g. *yesterday*, *fluffy*) become the old cursive script. So the problems in fluency that plagued the cursive style appear to continue in its replacement.

2. The criticisms outlined in this article about the Modified Cursive Copybooks (Kinsella, 1969) also apply to the copybooks currently available for Foundation style (Nightingale, 1985). For example, fluency is repeatedly mentioned yet no rate measures are built into the program. Evaluation is teacher initiated and controlled, with no provision for pointing out the similarities or minimal differences between the model and children's work.

Overall, the main strength of the new handwriting policy in NSW schools is that letter shapes are based on three basic movements and that there is provision for teaching to become a continuous process, from infants to primary grades, with minimal re-learning. However, problems appear to remain in relation to the achievement of fluency, and the copybooks currently available to not incorporate the most efficient teaching strategies. Perhaps classroom-based research on the implementation of the new program will provide a basis upon which these problems can be overcome.

APPENDIX A SUMMARY SHEET FOR M.U.S.E.C. MODIFIED CURSIVE WRITING PROGRAM

Section	Letter	Test
1. *i* type formation	(1) *i* (2) *u* (3) *w*	(1a) *i* test (2a) *u* test (3a) *i*, *u*, *w* test
2. *l* type formation	(4) *l* (5) *t* (6) *b*	(6a) *l*, *t*, *b* test
3. *h* type formation	(7) *h* (8) *p* (9) *k*	(9a) *h*, *p*, *k* test
4. *n* type formation	(10) *n* (11) *m* (12) *r* (13) *v*	(13a) *n*, *m*, *r*, *v* test
5. *a* type formation	(14) *a* (15) *o* (16) *c*	(16a) *a*, *o*, *c* test
6. *d* type formation	(17) *d* (18) *g* (19) *q*	(19a) *d*, *g*, *q* test
7. miscellaneous formations	(20) *e* (21) *s* (22) *j*	(22a) *e*, *s*, *j* test
8. miscellaneous formations	(23) *y* (24) *f*	(24a) *y* and *z* test
9. miscellaneous formations	(25) *z* (26) *x*	(26a test of all letters

Chapter 13

PROMOTING MATHEMATICS IN THE CLASSROOM: HOW TO DIVIDE ONE TEACHER AMONG 30 CHILDREN

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There is evidence that about 20 per cent of Australian school children, on completing their compulsory school phase at 14, have not achieved an adequate level of competence in basic mathematics or reading (Keeves, Matthews & Bourke, 1978; Bourke, Mills, Stanyon & Holyes, 1981). In their recommendations for future planning, based on the results of their survey on literacy and numeracy in Australian schools, Keeves et al (1978) took the position that 'all students in regular schools needed to have the opportunity to reach a minimum standard of literacy and numeracy if they were not to be seriously disadvantaged both in further schooling and throughout adult life' (p.47). If basic skill mastery is to be the goal for all Australian school children, it is ultimately the regular class teacher on whom responsibility for its implementation will be placed. This chapter outlines a number of classroom procedures which may assist teachers to achieve this objective for all children including those with disabilities who are currently being mainstreamed in regular classes.

One of the major difficulties now confronting teachers in assisting students to master basic skills is the heterogeneous nature of the students in regular classes. This has resulted from an increasing emphasis on mixed ability groupings and on mainstreaming students with disabilities. For example, in a recent study of a Year 7 class in a metropolitan N.S.W. high school, it was found that reading ages ranged from 8.1 to 17+ years. Thus it would seem that traditional 'whole-class' instruction, based on a curriculum which assumes that all children have mastered the necessary prerequisite skills, is likely to be relatively ineffective for many students in such a classroom, where chronological age may be the children's only uniform attribute. If basic literacy and numeracy are to become realistic educational objectives for heterogeneous groups of pupils, then teachers may need to become even more familiar with three critical features of classroom practice:

1. assessment procedures
2. implementing a curriculum
3. classroom organisation

The following sections of this chapter will examine, in turn, each of these aspects of classroom practice using examples, where possible, drawn from the area of mathematics teaching in infants and lower primary grades.

1. Assessment Procedures

When a teacher is concerned about student progress, two types of assessment procedures are commonly available upon which to base an education program; a) psycho-educational and b) task-analytic procedures. Both measures can give a teacher useful information about students' abilities and achievement, but it is important that teachers understand how the tests differ and how the information derived from them can be used most effectively.

(a) Psycho-educational or norm-referenced assessment procedures, usually administered by a school counsellor/guidance officer, are typically concerned with providing a profile of a student's psychological or academic abilities relative to other students of the same chronological age or school grade. The measures currently reported in psycho-educational assessments of Australian students include measures of general cognitive functioning (e.g. revised Wechsler Intelligence Scale for Children—WISC-R), psycholinguistic abilities (e.g. Illinois Test of Psycholinguistic Ability—ITPA), underlying cognitive processes (e.g. Kaufman Assessment Battery—KAB), perceptual skills (e.g. Frostig Test), visual motor functioning (e.g. Bender-Gestalt shape copying test), behavioural deviancy (e.g. Rutter Behaviour Questionnaire) and basic school achievement (e.g. Neale Test of Reading Ability, Keymath).

There is no doubt that normative measures of the kind described above, which define children's psychological abilities relative to their normal peer group, are an important part of evaluation procedures. They may indicate possible sensory, physical or emotional disabilities which can directly impede school performance and may need further professional investigation. Psychological tests which examine processing strengths and deficits, such as the ITPA or the KAB, may also be used diagnostically to elicit a student's preferred mode of learning as a basis for planning the most appropriate remedial program (e.g. through a visual rather than an auditory mode or through sequential rather than simultaneous presentation of material). However, empirical evidence on the efficacy of teaching to a child's preferred learning style is somewhat meagre (Meyers, 1980, Tarver & Dawson, 1978) so the value of using test scores for this purpose remains in doubt. Indeed, there has been evidence to suggest that the focus of assessment should be shifted from the student's learning style to the student's responsiveness to instruction (Zigmond & Miller, 1986).

Norm-referenced measures may also be used to confirm or deny teachers' impressions that some children are cognitively delayed in their development and will probably reach educational goals at a slower rate than their peers. Unfortunately, teachers do not always fully understand the implications of normative test scores reported to them by school counsellors and others, so that a one-to-one relationship is often assumed between a child's IQ and school achievement. Such an assumption may be erroneous for individual students and may cause teachers to label some pupils are underachievers, rather than to try alternative methods of instruction that may be more effective.

In summary, psycho-education measures may alert teachers to possible weaknesses in processing information that may be associated with poor school performance. However, to this point, such information has not generally assisted teachers to design appropriate teaching programs for students with such problems, since underlying psychological disabilities rarely provide information directly relevant to remediation of current basic skill deficits. Until further research reveals a relationship between underlying cognitive processes and school-oriented tasks, the results of psycho-educational assessments are likely to have limited utility for teachers. Of more practical application for classroom practitioners is the information that can be derived from task-analytic or criterion-referenced assessments.

(b) Task analytic or criterion-referenced assessments, usually administered by teachers, are used to determine the level of a student's mastery of specified areas such as mathematics, reading or spelling, in order to establish a baseline from which to plan an educational program. This form of assessment is therefore not designed to compare children's achievement with that of their peers, but rather attempts to pinpoint difficulties within a subject so that the next teaching step can be planned for a particular child. In a heterogeneous class, for example, task-analytic measures in basic skill areas can establish whether all students have the prerequisite skills to proceed with the planned curriculum. Tests in basic mathematical operations or word attack skills developed at the Special Education Centre, Macquarie University, are examples of task-analytic measures which may be used to identify broad areas of difficulty within hierarchically-organised subject areas.

An example of the use of such tests is as follows:

> in the domain of mathematics, the next step in the curriculum for a particular class is to teach the basic addition facts for 'near tens' (e.g. 9 + 7, 9 + 8).

Before starting such a lesson, the children need to understand the concept of addition and to have mastered the simpler facts, such as 'add doubles' (e.g. 6 + 6). If, as may often occur with a heterogeneous group, some students are unsure of prerequisite skills, it will be necessary to revise those skills with these students before proceeding to the planned objective.

Task analytic or criterion-referenced measures make the assumption that a skill to be taught consists of a set of hierarchically-organised sub-skills. Regardless of a child's particular disability, mastery of the appropriate sequence of sub-skills must be established before teaching of higher-level skills in the sequence can begin. Underlying this view of assessment and teaching is the belief that, while the impact of factors such as general intellectual ability, physical impairment or poor socio-economic conditions on student achievement of basic numeracy and literacy skills cannot be directly addressed in the classroom (apart from providing appropriate protheses), improving the quality and effectiveness of teaching is a legitimate goal of the classroom teacher.

While criterion-referenced tests applicable for screening large groups of children can be both devised and administered by the teacher in the classroom, individual children may need to be more precisely screened in areas of identified difficulty. For example, if a teacher notices that a child makes frequent errors in addition and subtraction computational problems, it is then necessary to investigate further, to determine if this difficulty results from a weakness in the child's understanding of the processes involved in the task (e.g. how and when to regroup) or in the skills required to achieve the answer (e.g. inaccuracies in basic addition and subtraction facts). Such an individual assessment may involve giving additional examples at the subskill level as well as an interview with the child and, since this procedure is time consuming, it may be more appropriately carried out by a resource teacher or school counsellor.

In the preceding discussion, it has been suggested that the correct use of assessment procedures is the first critical element in the effective teaching of heterogeneous groups of children. However, to use the information provided by such assessments, teachers may need to develop curricula, or more often, modify existing curricula to facilitate children's acquisition of basic concepts.

2. Implementing a curriculum

In this section, some issues are discussed which seem relevant to teaching mathematics to the early primary grades. First, some of the processes underlying children's acquisition

of numeracy skills are considered as a basis for curriculum design. Then some appropriate steps are suggested to help children when current mathematical programs are either not sufficiently finely sequenced or sufficiently prescriptive.

It is now accepted by many mathematics educators that children impose their own structure or schema on knowledge they acquire. Thus it is important that new material is presented to children in such a way as to assist them to identify the interrelationships between concepts already assimilated and those to be acquired. This will ensure that they build a logically correct and coherent schema. The importance of developing a well-structured conceptual network is exemplified by studies of people solving mathematical problems. Expert mathematical problem-solvers have been found to organise their knowledge in large related chunks based on fundamental concepts, while poor or novice problem-solvers tend to store knowledge in isolated fragments, sorting it on the basis of superficial properties and attending to irrelevant information (Carpenter, 1984). These latter strategies predispose less capable children to learn rules which may not be seen as part of a logically consistent pattern. They may thus ignore inconsistencies which would alert competent students to a need to re-examine their solutions. For example, if, in a simple computation problem, a child obtains two different answers to $3 + 5 = \square$ and $5 + 3 = \square$, less capable students may simply consider that these are two separate problems and may not reconsider their answers. On the other hand, students who understand the concept of commutativity would look for an error in one of their solutions.

When introducing a new concept, it is important both to relate it to concepts that children already understand and to present a wide range of examples. Without these steps, children may not connect the new concept with their previous knowledge (e.g. the relationship of multiplication to repeated addition, or they may incorporate limitations into their perception of the new concept that reflect specific aspects of the teaching examples used (for example, children may believe that only 'right angles' are angles or that 'more' always means 'add'). Giving a wide range of examples, including negative instances, may prevent the development of such misconceptions by focussing children's attention on the relevant, invariant attributes of the concept. Such an understanding enables children to more readily transfer and generalise their knowledge to other related concepts.

Most children begin school with some knowledge of numbers and counting. Ginsberg (1977) believes that a crucial aspect of mathematics is learning how numbers behave and detecting underlying patterns and regularities (numeration). Many children work out their own informal methods for solving mathematical problems and since these invented methods rely heavily on counting, it is important that children can count fluently. However, the accurate use of the number words does not necessarily imply understanding. There are various difficulties that children may experience with counting, such as considering a number as a specific visual pattern or as a label for a particular object. They may not realise that the order of counting is irrelevant, that the cardinal number remains the same no matter how the elements are arranged or that the number given to the last thing counted refers to the collection as a whole. For example:

> A child counts out three lollies; the teacher takes away the first two. When asked 'What is left?' the child replies 'three'. The child is using 'one', 'two' and 'three' as labels for particular objects rather than as a count of how many lollies in the collection.

Such misunderstandings may be difficult to detect without asking the child to explain how the answer was obtained. A similar misconception common among young children is their failure to realise that two different representations, e.g. ⁘ and ⁙ are both symbolised by the numeral 5. Children can be weaned from the dependence on counting 'real' objects by giving them tasks where some of the objects to be counted are hidden. This

encourages the development of a more abstract concept of number that may help bridge the gap between the objects themselves and their symbolic representation.

A further cause of children's difficulties with number tasks has been the emphasis that has been given to calculations expressed in symbolic forms in many traditional mathematics programs. The mechanical manipulation of symbols with no regard to meaning encourages the memorisation of rules rather than a consideration of the concepts involved (e.g. children may add 1 to the top line and 1 to the bottom line in a subtraction algorithm requiring regrouping without connecting this procedure with place value). One approach that may assist children to give meaning to the number system and operations within it is through activities with concrete materials including toys, counters, bundling sticks and multi-attribute blocks. Activities with such objects generally precede paper-and-pencil activities and are valuable, as these experiences help children associate an action with a task (e.g. joining sets) and do not require the same degree of fine motor control as written work. However, the links between such activities and the formal language of mathematics (involving both words and symbols) must be systematically taught since few children will generalise, on their own, from the concrete to the abstract representation. If connections between these activities and mathematical processes are not taught, children may reason erroneously when they attempt to move from tangible materials to the formalised world of mathematics. However, prior exposure to manipulation of objects should assist children to understand the formalisation of number concepts when the relationship between the two is introduced (e.g. multi-attribute blocks may assist children's understanding of place value).

Recognition of the inter-connectedness of algorithms for the four operations may reduce children's dependence on rules. Booker (1983) suggested that three understandings were common to all such problems. These were:

1. a knowledge of place value
2. a knowledge of basic facts, and
3. an ability to regroup units (ones, tens, etc.)

However, in 'real' life, problems are not usually presented in an algorithmic form and research has found that selecting the correct number expression to represent a given word problem presents difficulties for many children. Booth (1984) reported that although children were often able to solve a given problem, they could not necessarily select the appropriate number sentence from among those presented. The errors made in selecting the correct number sentences reflected arbitrary points of view about the meaning of notation (e.g. children often thought that $23 - 239$ means '23 divided into 239'), the meaning of operations (e.g. 'you always divide the big number by the small number') and the nature of mathematical representation (e.g. commutativity is equivalent to symmetry). Interviewers discovered that children solved problems by strategies such as 'counting-on', 'repeated addition' or 'grouping by systematic trial-and-error.' Unfortunately such strategies are only useful when the numbers involved are relatively small and can be dealt with 'intuitively'. Intuitive strategies such as those described in the previous paragraph are commonly used by children with learning difficulties, for example:

> Asked to solve the problem '8 children have ten cents each. How much money do they have altogether?' Vera answered 80 and then wrote $8 \quad 10 = 80$. She explained to the teacher that she did not know what sign to put in the equation.

Vera's confusion stemmed from her realisation that $8 + 10$ was incorrect, but she did not understand the relationship of the strategy she used (repeated addition) to multiplication. These results suggest that providing children with a calculator for such everyday problems will be of limited value unless they understand the relationship between the process they use to solve a problem and the mathematical notation required to enter the algorithm into a calculator. In addition to showing children the connection between their strategy and the more formal mathematical one, it is also important that they be shown the limitations of their

approach. Evidence from the Concepts in Secondary Mathematics and Science project in Britain (Hart, 1984) indicated that fifteen year old children tried to solve problems set in the secondary school using methods they had learnt as seven year olds. Such methods were obviously inadequate for the problems the children were attempting to solve at this level.

It has already been suggested that the failure of some children to enjoy and make sense of mathematics at the primary school level may sometimes be attributed to teaching that is biased towards completing computational problems without first ensuring that the children understand the concept underlying the procedure they are applying. However, the reverse situation may also occur where children have an informal understanding of a concept (say addition) but do not connect this with the standard symbolic form. For instance, while a child may quickly compute mentally that 18 apples and 5 more is 23 apples by counting on from 18, the symbolic form $18 + 5 = \square$ may be considered as a different problem that is solved using a partially understood rule for manipulating numbers. For this reason, it is important that teachers build upon the child's own informal strategies wherever possible. 'Counting on' and 'counting back' are common strategies that children employ and these can be used to assist children's comprehension of the algorithm. Place value plays an important part in understanding computational procedures; unless children are familiar with the structure of the number system they will have difficulty solving problems whose method of solution is a function of that system (e.g. the notion of regrouping). Trading games and activities involving money assist children to understand when regrouping is necessary. Appropriate numeration activities with a variety of material should parallel the introduction of formal computational methods so that children can relate the symbolic form of the algorithm to a variety of familiar contexts.

To ensure that children perceive the relevance of mathematics to their daily lives, mathematical problems concerning every day situations should be included wherever possible in the mathematics curriculum. For example, fraction tasks might include reducing or enlarging a drawing or the quantities in a mixture. Problems should always have reasonable solutions or teachers risk encouraging attitudes such as 'I wouldn't be worried if a train was going at 1000 miles per hour in a maths question... they do put things like that sometimes' (Watson, 1980). Children should not be 'trained' to use a specific algorithm to solve a particular type of problem but should be encouraged to discuss solutions to check that the answer is sensible. Conflict situations may be generated if children are given problems that result in 'nonsense' solutions when solved by a routine algorithm. For example, Markovits, Hershkovwitz and Bruckheimer (1984) set problems such as '236 trees were planted in 6 rows. How many trees do you think there were in each row?'

An equivalent problem concerned allocating children to buses. They found that about one third of grade 5 and 6 children were happy to give an answer in terms of fractional trees. Older children became more perturbed with fractional answers (they were particularly loathe to cut up children) and so were more willing to consider answers where the group sizes were unequal, rather than the answer that resulted from an unthinking application of the standard algorithm.

Children's errors often provide insight into the way a child thinks about a problem. Sometimes children's strategies can be inferred from the answers they give and this can be confirmed by asking them to explain what they are doing while working through a problem. Errors frequently result not from failing to learn an algorithm but from learning or applying the wrong algorithm. Children will construct their own modifications to an algorithm if they are confronted by a problem for which the procedure they have learned is inadequate. For example, the common incorrect answers made by grade 5 children faced with a subtrac-

tion problem such as 104 − 75 = □ are 39 (failure to regroup tens) 129 (failure to regroup hundreds) and 31 (subtraction of the smaller digit from the larger digit). Dealing with zero can often pose difficulties for students. When the division problem 624 ÷ 4 was given to a large sample of children (1144) at the end of grade 5, fourteen percent of the sample answered 14 and a further six percent answered 1r4 or 10r4. Less common answer patterns indicated that students were using their own modifications of the algorithm, such as dividing the divisor by the dividend (answer 131r2) or regrouping when this was not technically possible (answer 122r2).

The equivalence of problems presented in different formats (e.g. horizontal and vertical) is not always obvious to children and they may learn to solve problems only when posed in a particular form. For example, in the same sample of grade 5 students, 75% of children could correctly answer:

$$\begin{array}{r} 3.91+ \\ .01 \\ \hline 2.03 \end{array}$$

but only 33% could correctly answer 5 + 2.1 = □. The common incorrect answers were 8 or .8 (11%) and 2.6 or 26 (31%). If children can only solve decimal problems in vertical form, then it is unlikely that decimal place value is understood as they are probably solving such problems by ignoring the decimal point. More children may have answered the latter problem successfully if it had been written $5 + $2.10 + □ because the problem can then be linked to familiar materials. Such errors may be less likely to occur if children learn to read the problem to themselves as though it referred to familiar objects, e.g. 5 apples plus two and a bit apples.

This section has attempted to outline some aspects of developmental mathematical processes with which teachers should be familiar in order to design or evaluate a curriculum for infants and primary grades. Emphasis has been placed on the introduction of new concepts by linking them to concepts which are already familiar, and the importance of developing in children logically correct and coherent schema. Attention has also been drawn to the teaching of numeration skills, or the interrelationships among numbers, as well as the use of everyday materials and activities to give meaning to the number system and the operations within it. The importance of children's not developing incorrect or inefficient methods for information storage and organisation has also been stressed, since these are often difficult both to detect and to eradicate, while examination of errors has also been advised as it often reveals the way children perceive mathematical problems. Assessment, as outlined earlier, should therefore be an integral part of any teaching program, firstly before any instruction commences and then as a check to ensure that what each child learns actually matches what the teacher intended to teach. A teacher working from a well-sequenced curriculum should regularly check students' progress by presenting them with a selection of tasks of increasing difficulty related to the steps in the sequences. Such assessment provides the teacher with information directly related to the program being taught, as well as feedback concerning possible difficulties with the sequence itself.

Curriculum Modification

Classroom teachers have reported a variety of problems associated with the curriculum materials and texts available to teach mathematics, particularly to slower students (Cawley, 1984). A common problem concerns the readability of the material as the less able children in the group may find that the reading levels are too high. Moreover, since

learning difficulties in mathematics are frequently connected with problems in reading, factors associated with poor reading skills often contribute to children's lack of progress in mathematics, especially in higher grades.

The sequencing of skills in text books may also be poor. This can result from a number of factors, such as insufficient attention being given to prerequisite skills, the steps set out being too large or the topics not being adequately linked together. Consider, for example, the following objective—'Recognising and matching sets of 5. What does a teacher do if a child cannot recognise and match sets to five?' A first step might be to limit the set to fewer elements. It is also important to know which aspect is difficult for the child; recognising sets, matching sets or both tasks. In practice, the teacher may need to consider several teaching steps to achieve this single objective, such as first counting sets for the child, then asking the child to count the objects aloud. Next the child might be asked to identify how many elements the set contains before making sets that have a given number of elements. It is important that the child realises that the number of elements in the set does not change if the objects are rearranged.

While a curriculum may include guidelines for teaching the objectives, these often do not suggest any structure for lessons or the important aspects on which to focus when engaging in such activities with children. It is helpful if the teaching guidelines give suggestions as to how the task relates to subsequent steps in the curriculum so that the children's attention can be drawn to these features. Focussing attention on the important aspects of the task is particularly necessary for the slower child. For example, if the child cannot sort a collection of red, blue and yellow blocks by colour, then a simple sequence of actions such as the following should be considered:

(a) providing a prompt, e.g. 'the red block goes with the red block, the blue block with the blue block, where does the yellow one go?'
(b) modelling the correct solution, e.g. 'Watch me sort the blocks. I'll put the red one in the red pile, the blue one in the blue pile and the yellow one in the yellow pile. Now you have a turn.'
(c) simplifying the task, e.g. reduce the number of colours to be sorted to two and/or minimise distracting elements, such as shape or size.

When the children are involved in informal sorting activities they should be encouraged to give reasons for the classification they make and also be asked if they can think of another way the material could be grouped. Some teacher-directed sorting tasks should be included to ensure that the children understand the task. A first step would be for the children to sort on one attribute. Attributes that might be considered are:

same/different
colour/shape/size (big, little)
depth (thick, thin)

The children could be asked to sort a collection of things by one of these attributes (e.g. 'Put all the ones that are the same together' or 'Put all the red ones in one pile and all the blue ones in another pile'). These groupings could then be discussed with the children in terms of 'same' and 'different'. The teacher or other children might select groups of objects and ask the child to guess in what way things in this group are alike. Negative instances should be emphasised, e.g. 'This is not red so it does not belong with the red things.'

3. Classroom organisation

a) Within-class grouping

When teachers have established a child's entry skills on an appropriately designed and sequenced curriculum they then face the problem of the best way to organise their classroom for the most effective instruction. Traditionally, whole-class teaching, with lessons structured competitively, has been the preferred mode of instruction in most classrooms. However, this type of classroom organisation creates difficulties on two fronts. In the first place, whole-group instruction is rarely successful in a heterogeneous classroom, if assessment has revealed various levels of competence amongst pupils. Secondly, when lessons are structured competitively, students work against each other to achieve a goal that only one or a few, at best, can attain (Johnson & Johnson, 1986). Such a classroom organisation induces one of two patterns of response among the students. They either work hard to outstrip their classmates or they fail to study because they do not believe they have a chance of an academic win.

An alternative to whole-group teaching has been provided by full-time individualised instruction, by which students work on their own to accomplish learning goals unrelated to those of their classmates. In an individualistic learning situation, students' goal achievements are independent of each other. Students seek outcomes that are personally beneficial and ignore the goal achievements of the classmates (Johnson & Johnson, 1986). However, full-time individualised instruction is not feasible, and, like whole-class instruction, has not been found to be productive in a regular classroom (Bangert, Kulik & Kulik, 1983; Miller, 1976; Schoen, 1976). In an analysis of the failure of individualised instruction, Slavin (1984) found that it did not meet the four criteria he hypothesized as necessary for effective instruction:

1. quality of instruction
2. appropriate levels of instruction
3. incentive
4. time

Slavin maintained that individualised instruction was only successful in meeting the second criterion, setting appropriate levels of instruction. However, lack of opportunity for direct teacher and peer interaction reduced both the quality of instruction and student motivation, while emphasis on seatwork decreased engaged time on task.

A third option for the classroom teacher is a combination of small-group instruction and lesson goals structured cooperatively, so that students work together to accomplish shared academic objectives. This latter situation is most congruent with the goals of mainstreaming as it facilitates interactions between handicapped and non-handicapped students. A teacher can use a variety of strategies to encourage cooperative learning among students. Some of these are to set group goals and rewards; for instance, group averages of individual test scores may determine whether the group earns benefits, such as free-time, playing a computer game or going on an outing. Distributing resources so that these must be shared and giving students specific complementary roles to play in the group may also aid cooperation. Empirical evidence suggests that cooperative learning methods are superior to individual or competitive learning situations in fostering both social and academic development (Johnson & Johnson, 1981; Doise, 1985). Although structured cooperative learning situations are not commonly used by teachers, Slavin, Leavey and Madden (1984) have developed and evaluated a classroom organisational model for heterogeneous classes (Team Assisted Individualisation—TAI) that was designed to marry the best aspects of individualised instruction and cooperative learning.

This program will be described in some detail as research evidence of its success has been encouraging enough for teachers to consider grouping their classes in this way.

In the TAI program students are initially assessed to identify their level of competency, for example, in mathematical concepts and algorithms, using criterion-referenced assessment. They are then formed into 4-5 teams, each comprising students working on individualised materials at their own levels and rates. The students cooperate within their teams, helping others with problems and taking responsibility for almost all the checking and management tasks inherent in an individualised program. This frees the teacher to spend class time working with small numbers of students of the same ability level drawn from the heterogeneous groups. Motivation is maintained by each week rewarding the team on the basis of the average number and accuracy of units completed by all team members. As in all individualised instructional programs, appropriate levels of instruction are maintained by grouping students on the basis of an initial assessment. While the TAI assessment only tests the algorithmic aspect of the student's knowledge of mathematics, the organisational principles of the program can be extended to cover other aspects of the mathematics curriculum.

An evaluation of the TAI program using individual levels analyses on the mathematics achievement of academically handicapped and non-handicapped students found that the performance of the experimental group was superior to that of a control group both for mathematical computation and concepts, for the full sample of students and also for a subsample of academically handicapped students (Slavin, Madden & Leavey, 1984).

It is recognised, of course, that the classroom organisation necessary in such a program initially involves a substantial amount of preparation on the part of the teacher. While the original program was based on a teacher's manual, prepared curricula and student workbooks, teachers may wish to implement only the classroom organisational plan and use their own teaching materials. However, materials would need to cover 4-5 different ability levels and worksheets and test for individual use would need to be prepared prior to the commencement of the program.

b) Across-grade grouping

Family grouping across grades is yet another method of school organisation which takes advantage of the heterogeneous nature of individual classes. For example, by grouping some 3rd, 4th, 5th and 6th graders together into a cohesive family unit, young advanced children or older less able children can work on curriculum areas best suited to their ability. Moreover, cross-age tutors can be utilized both to assist teachers in academic areas and to enhance social relationships within the school. This type of organisation needs to be at a whole school level, with constant cooperation between principal and teachers. This is not dissimilar in many ways from arrangements such as composite classes, although the latter appear often to be organised because of student number anomalies relative to teachers across grades and the groupings may remain static across all subject areas.

The two forms of grouping outlined above, cooperative grouping and family grouping, have been suggested as models of class/school organisation which may obviate some of the weaknesses of traditional grouping practices based on student ability (e.g. streaming across a grade). In a summary of the research on fixed ability groups, Hallinan (1984) found that in practice, organisational constraints often played a more important role in group formation than an individual student's ability. Furthermore, once children were streamed, the quality of instruction tended to differ across groups. Thus, higher ability students seemed to be presented with instructional material which was more challenging, more interesting,

better prepared and faster paced, while in the low ability groups, more time was spent on off-task activities, disciplinary actions and non-verbal interactions. Furthermore, it appeared that while static ability grouping might benefit high ability students they tended to be detrimental to students in the average and low-average streams.

By grouping children flexibly, heterogeneity is maintained for a reasonable proportion of the time and streaming is employed only for the introduction of a new concept by the teacher. When students of differing abilities or differing ages learn together, good role models are established for less able or less mature students, while at the same time a pool of peer or cross-age tutors is provided as a resource to the regular teachers.

There is a growing body of evidence about the efficacy of peer or cross-age tutoring as a means of handling difficult educational problems such as the individualisation of instruction or the integration of students with disabilities (Doenau, 1985).

In a meta-analysis of the efficacy of peer tutoring programs, using 52 students, Cohen, Kulik and Kulik (1982) reached the following conclusion:

1. there was a significantly positive effect for academic achievement in favour of tutored students when compared with a non-tutored control group.
2. the strongest effects were in more structured programs, programs of shorter duration (0-4 weeks), programs with lower level skills, programs tested on locally developed instruments and in mathematics programs rather than those associated with reading.
3. there was also significantly higher positive effects on academic achievement for tutors themselves over a control group.

The results support the testimonial issued by Follo and Norman (1981) which indicated that the peer teacher model benefitted all participants since exceptional children received a more effective education, classroom teachers were freed to reach more children, and the peer tutors themselves gained in both affective and cognitive skills.

Another under-utilized resource for the teacher in a heterogeneous classroom is the deployment of parent volunteers. Although, historically, there has been some reluctance about using parents as volunteers within the schools (Cooper, unpublished thesis), there has been a move towards greater cooperation between parents and teachers in classes. In a recent study, Cooper (1984) used volunteer mothers to tutor poor readers in Year 3 across several Sydney primary schools. She found that after one term of tutoring, the children demonstrated considerable improvement on test scores compared with gains made by a control group selected from the same classes. The author argued that while effective remedial teaching certainly required expertise, schools were unlikely to ever have enough expert teachers available for the large numbers of children who needed such help. Her pilot project demonstrated that volunteer parents, supervised by staff and provided with a finely sequenced program of word attack flash cards, worksheets and graded readers, could significantly improve the weakest children's mastery over the basic skill area of reading.

In this section on classroom organisation, attention has been directed both to various means of grouping children for instructional purposes and to the most efficient use of available resources for facilitating the teaching of basic skills to a widely divergent group of students. However, it has also attempted to highlight the interdependency of all three aspects of classroom practice outlined at the beginning of this chapter. Before they can group children on the basis of subject knowledge, teachers need to be familiar with the procedures of diagnostic assessment. Furthermore, effective instruction can only take place within a working knowledge of curriculum implementation so that a syllabus can be adapted to varying ability levels. Finally, familiarity with available resources and the ability to

train peer tutors or volunteers are an invaluable aid to the practice of effective instruction.

In conclusion, it is our hope that by drawing attention of teachers in mainstreamed classes to these three critical variables of classroom practice, we may enable them to face the challenge of integration with increased understanding and confidence.

Chapter 14

COMPUTERS IN THE CLASSROOM: HOW TO HIT THE RIGHT KEY

Lynne Outhred

INTRODUCTION

Computers are increasingly becoming an integral part of both primary and secondary classrooms in Australia. In 1983 the Commonwealth Schools Commission expressed the view that 'the development of a satisfactory program of computer education in Australian schools was of fundamental importance to Australia's future' (Tannock, 1983, p.1). The Commonwealth Schools Commission subsequently announced that eighteen million dollars would be spent in the 1984-1986 triennium for a Computer Education Program. In N.S.W. a Computer Education Unit was set up to coordinate the introduction of computers to the state school system. Initial funding concentrated on secondary schools but policy directions beyond 1984 included the extension of the program to primary schools. A report 'Teaching, Learning and Computers in Primary Schools' was published in 1985 and recommendations made in this report strongly supported the use of computers to foster the attainment of more equal outcomes in education, with special provision being established for groups such as the disabled (Section 4.10, Recommendations 2, 6, 9, Axton, 1985).

At the present time teachers are still learning about the most effective use of computers in their classrooms and it is difficult to predict how the availability of such technology may affect and change the present curriculum, aspects of student learning and integration policy. For instance, spelling checkers and word processing systems may eventually de-emphasise spelling and hand-writing in the school curriculum and computers may facilitate abstract thinking by providing an accessible model linking concrete and symbolic thought. This linkage may have important implications for the acquisition of spatial concepts, for example, by children with physical impairments who cannot easily manipulate objects. Computers offer an effective means for handicapped children to communicate with others and this may enable such children to be more easily integrated in regular schools.

This chapter will mainly focus on how computers can be used in regular primary classrooms with children who have learning difficulties. The applications considered will be restricted to those where the computer is used as an instructional tool with either a single child or a small group of children. Since computers are particularly valuable for groups with specific handicaps, for example, blind or cerebral-palsied children, an overview of some of the adaptive devices currently available for such groups is given at the end of the chapter.

THE COMPUTER IN THE CLASSROOM

In the classroom the computer can assume a variety of teaching roles dependent not only upon the available software but also on an individual teacher's class organisation and teaching style. The computer can provide challenging and motivating problems, act as a word processor, an electronic blackboard, an individual tutor or a communication device. Classroom applications include tests, drills, simulations and games. Computers can assist teachers to tailor material to an individual child's needs and abilities, in addition to managing the routine aspects of instruction. They can also act as an administrative tool for the management and production of information. However, integrating computers into the classroom curriculum is not an easy task and a number of considerations should be kept in mind. For example:

(1) The number and siting of the machines will affect the pattern of classroom use. A laboratory setting will encourage different applications from those where a computer is simply part of the class equipment. The decision about the location of hardware will affect children's access to the computer and also influence whether computer use is individual rather than group oriented.

(2) The availability of software will also need to be considered. If the computer is to be used for children with special learning needs, published software will frequently be unsuitable. Software written for average achieving children is often too difficult for slow children. Common problems are that the screen display is too complex, changes occur rapidly or the reading level required is too high.

(3) The computer may be used for specific applications or integrated across the curriculum. For example, one school may be using the computer for language, mathematics, social studies and science whereas another may schedule the available time so that all classes have access for word-processing. The integration of handicapped children into regular schools may be facilitated if a computer is available. For example, a computer could be used to provide extra individualised instruction to a child with learning difficulties or could enable a blind or physically handicapped child to communicate.

TYPES OF SOFTWARE

Children with high incidence, low severity conditions, such as learning disabilities, mild emotional or mental handicap and communication disorders should generally be able to utilise programs developed for normal children. The criteria for selecting suitable programs should emphasise characteristics such as large print, a wide range of speed levels (particularly slow speeds), student control over progression, especially where reading is involved, and a clear, uncluttered screen display.

Seven categories of software often used in regular classrooms are described below. This list is not exclusive but provides a useful guide for identifying the aspect of classroom activity for which a particular piece of software is most suited. For instance, while drill programs have clearly defined objectives, their overall purpose is to consolidate and increase the fluency of specific skills. When computers were first introduced into schools, most software was of a drill or tutorial type and closely resembled a traditional lesson in style. This is now changing as educators have advocated for a number of years that software should capitalise on the unique capabilities of the computer, compared with other educational media. Designers are now responding to this pressure and producing creative educational software that presents material in a way that has not previously been feasible in the classroom.

The following categories describe the most popular software used in primary classrooms:

Games

There are an abundance of computer games available and while some may not have been designed for a classroom situation, a creative teacher can use them to motivate or extend aspects of children's learning, for example, adventure games offer many opportunities to enhance and extend language activities.

Drill

Software of the drill type is appropriate when a new skill has been acquired but needs to be practised until familiarity or fluency is gained. Drill programs are often in the form of a game and may motivate children to practise skills such as basic mathematical computations, spelling or aspects of grammar. A survey of special education teachers in the U.S.A. found drill programs were most commonly used (72%), followed by word processing programs (25%) (Mokros and Russell, 1985).

Tutorial

Tutorial programs usually display information or model skills and then question the student about specific aspects of the material presented. Such programs take the form of a dialogue between the student and the computer. The sequencing of questions may either be pre-determined or based on the student's responses.

Simulations

Simulation programs teach about some aspect of the world by imitating or replicating it. Students may solve problems, learn procedures and understand characteristics of the phenomenon being studied, including what actions are appropriate in particular situations. Simulations may model a process (such as shopping or banking) so that the student understands its operation and has been taught many of the skills involved before attempting the real-world situation. Alternatively, the simulation may be situational, with the student taking different roles in order to explore the effects of different approaches to solving a problem (e.g. how to survive on a desert island). Simulations of imaginary worlds (e.g. Flowers of Crystal, Dragonworld) may be used as a stimulus for creative work across the curriculum. Such programs usually include audio tapes, illustrated story books and suggestions for class activities.

Problem solving

Software falling into this category is becoming more common and includes both problems with a clearly defined goal (e.g. finding a path through a maze) and problems where students can set their own goals, such as writing a procedure to draw a desired picture using Logo, a computer language used in many schools.

Testing

Computers can be used as an aid in both the construction and administration of tests. Banks of items can be stored for later access, or a domain can be specified (e.g. The addition of a number (0-10) to a number (10-99), no regrouping required) and the computer can generate items satisfying these criteria (e.g. $25 + 4 = \square$). The administration of computerised tests have most of the same advantages and disadvantages of computerised instruction. On the positive side tests can be individualised, with responses marked and stored for later analysis. However, a major negative aspect is that the computer can only judge answers that are predicted beforehand and stored with the questions. This restricts the range of both problems and solutions that can be used in computer-based testing procedures.

Teaching Tools

Many programs developed for business applications are now being introduced into schools, for instance, word processors and data bases. These programs are not subject specific and their use is becoming widespread in both primary and secondary schools. Word processors allow children to elaborate and edit written work, such as stories, reports and projects, while data-bases, such as First Fleet and Australian Bushrangers, provide a bank of information about a particular topic that enables children to formulate hypotheses and then retrieve information to test them. For example, how many of the first convicts transported to Australia were murderers?

EVALUATION OF SOFTWARE

An important consideration when choosing a piece of software is whether it is intended to replace or enhance similar materials that are currently used in the classroom. If software is to replace existing materials then it should be more effective than such materials, for example, by increasing student involvement in and discussion of a topic or facilitating investigative or problem solving activities, or by freeing the teacher from routine aspects of a teaching task. Thought should also be given to the educational purpose of the program and whether it is consonant with the age, ability and experience of the children in the class.

There are a number of presentation aspects to consider when choosing software. For example, text is easier to read when it is divided into short, well-spaced paragraphs and set in upper and lower-case characters. The amount of information displayed between successive responses should be small and the user should be able to control the rate at which changes occur on the screen. Simple graphics are usually more effective than text, but animation and colour may detract from the educational content of the material, so they should only be used to focus the children's attention on important parts of the material displayed on the screen. For example, studies in Britain found that people looked for a reason whenever there was a colour change on the screen and that poor colour combinations, for example, red and blue, significantly increased the time taken to scan a word list (Alessi & Trollip, 1985).

POSSIBLE ROLES FOR A COMPUTER IN THE REGULAR CLASSROOM

LANGUAGE

Goldenberg, Russell and Carter (1984) suggest three categories of language programs; language-as-currency, language-as-subject-matter and communication tools.

(1) Language as currency

This category includes programs where language is the vehicle rather than the focus of the activity, for instance, adventure games and simulations. Children generally have some control over the sequencing of actions in these programs, but to take advantage of the interactive nature of such programs, basic reading and writing skills are required. More sophisticated programs of this type can accept misspellings and varied input within a limited language domain. Such activities are highly motivating and, for a child who has failed at language work involving similar reading levels in the classroom, have the advantage that language is a secondary requirement. For example, a segment of dialogue between the computer and a child (child's responses shown in bold-face print) in an adventure game might be:

You are standing in front of a door in a wall.

go in

The door is shut.

open

Do you mean open the door?

yes

In front of you is a room with a box in one corner.

There is a door on the other side of the room.

go in and open box

The box is locked.

what am I carrying?

You have a map, a torch, some food and a key.

unlock box

This example demonstrates several important features of adventure games designed for chilren with language problems. Firstly, the amount of text displayed is small and the vocabulary is simple. Feedback is used to encourage correct grammatical usage ('Do you mean open the door?') and the child can query the computer ('What am I carrying') as well as initiating actions. To be successful the child has to understand messages, remember prior events and synthesise this knowledge with the present situation. Each interchange involves the child's formulating and evaluating a strategy to solve a particular problem. Last but not least, adventure games are fun. Children love to play them and the potential threat inherent in a remedial lesson is vastly reduced. While some adventure games provide scenes depicting the setting for the adventure, this is not necessary and it may be preferable to encourage children to imagine their own context and link the game to other class activities (e.g. art). Children may also enjoy puzzling their classmates by writing their own adventure games, a task that demands planning a sequence of possible actions and their consequences.

(2) Language as subject matter

Programs in which language is the primary focus can be of two types, firstly, those concerned with the development of particular components of language, secondly, programs designed to stimulate students' understanding of meaning.

(i) *Programs that attempt to teach specific aspects of language*, such as spelling, vocabulary or puctuation. These activities are often presented in drill or tutorial format and may be particularly appropriate for children who like predictable tasks or who need to practise a skill. When a child has previously failed it is easier to ensure success on such tasks, as errors are minimised by the controlled pace and repetitive nature of the material.

However, not all aspects of language development can be successfully taught in this way. In a study at the Special Education Centre (Outhred & Hasselback, 1983) teachers encountered a number of problems when using a computer-based reading program in the primary classroom to develop the children's sight word vocabulary. For example, although the computer can display and say words, it cannot judge the correctness of an oral response and children cannot distinguish between their pronunciation of a word and the correct version (produced in this instance, by the computer controlling a tape recorder). Therefore, if a child is required to read words shown on a computer screen, there should be a competent reader present. In addition, unless the computer reading task involves more than simply relating a story, the children at the Centre preferred to read stories from a book with pictures.

(ii) *Programs that involve activities encouraging discussion about meaning*, such as sentence building or comprehension. For example, a sentence-building program designed by Mike Sharples (1981) from the University of Sussex allows the teacher to enter a list of words, say adjectives, into the computer. When a sentence containing any of these adjec-

tives is entered, the computer replaces the adjectives from the list with '*'. To eliminate each '*', the children must find adjectives that the computer does not know (i.e. words not included on the original list). For example, 'The small cat sat on the green mat' becomes 'The '*' cat sat on the '*' mat'. The teacher then asks the children for suggestions and discusses what type of word would be appropriate, for instance, that cat might be described as furry or supercilious. The children can then see if the computer knows these adjectives. In this way children can be motivated to find synonyms, extend their vocabulary and recognise different parts of speech. An unique example of a program of this type for use with younger children is PODD. Podd is a character who can 'do' things such as jump, eat, cry and talk. The children suggest actions and a message appears on the screen when Podd cannot perform an action, for instance Podd cannot skip or swim. Podd can also perform a sequence of actions (fly, sneeze and pop perhaps).

A novel approach to language comprehension has been taken by a group based at Queens's University in Canada (Miller & Burnett, in press). Their program, 'The Puzzler', is designed to develop and enhance prediction strategies. For example, the first sentence of a story called 'Sammy' reads 'I have loved Sammy from the first moment we met.' This sentence creates a lot of discussion about who or what is Sammy. However, these predictions cannot be tested until more information is available, so this initial phase leads naturally into the confirming process. The computer displays one page at a time and will not load the next page until the child makes a new prediction, or changes the current set of predictions. A major concern of the authors of the package is that children do not worry about whether predictions are right or wrong but rather, whether they can be justified on the basis of what is known about the story at that stage. At present this program comes with a set of stories but it is planned to include an editor so that teachers can write their own stories if they wish.

In interactive story builders such as Storytree, stories branch out from one beginning to many different endings. Children choose their preferred option at each decision point as they read a story. They can also write stories that may branch, either by asking the reader to make a choice or by going to one page sometimes but another page on other occasions. If the children wish, they can change a story they read, thus they have the power to determine how the story ends. These programs help foster higher level story organisation and could, perhaps, be classed as a communication tool although they are not as flexible as a word-processing program.

(3) Tools for communication

Communication tools facilitate the production of written material and the most commonly used are probably word processors. These seem to be a perfect tool for composition development as they eliminate the difficulties some children have in actually forming letters and setting out their work on a page. However, like most tools, their effective use is highly dependent on the teacher's auxiliary role in encouraging children to write and teaching them to extend and revise their written work.

Learning disabled children may especially benefit from using a word-processor as research indicates that they write less and do not perform as well as their normal peers on the mechanical and stylistic aspects of written language (Poplin, Gray, Larsen, Banikowaki & Mehring, 1980; Graham, 1982). Bobrow (1984) found that story length increased in the group of learning disabled children who wrote their stories using a word-processing program. This result has also been reported by other researchers (Levin, Boruta & Vasconcellos, 1983; Quinsaat, 1983). Miller (1985) suggested that the reasons for this increase include the novelty of using a computer, the prodding effect of the cursor, elimination of the

messy page that prompts some children to begin again, congruence between typing speed and thinking and the teachers' willingness to allow children to select their own topics to write about.

More comprehensive writing packages are now being developed. One of these, Quill, comprises three separate parts that share a word-processor, The Writer's Assistant, for writing and revising work. The three parts comprise the Planner, an organised note taker; the Library, a publisher so that the children can easily format their newspapers and books; and the Mailbag, an electronic message system. However, doubts have been expressed about the suitability of Quill for use in schools. Olds (1985) for example, believes that Quill is too cumbersome and complex for children to use easily, however, further development of this program may overcome such criticisms.

MATHEMATICS

The Cockcroft Report (1982), concerning the teaching of mathematics in British schools, recommended that opportunities should be provided in mathematics classes for:

> Exposition by the teacher.
> Discussion between teachers and pupils and among pupils themselves.
> Appropriate practical work.
> Consolidation and practice of fundamental skills and routines.
> Problem solving, including applications to everyday situations.
> Investigational work.

A group at Nottingham University (Ridgeway, et al. 1983) felt that four of these activities (mathematical discussions, practical work, problem solving and investigational work) took place far too infrequently in British schools. They set out to investigate whether a computer would help or hinder the implementation of the recommendations made in the Cockcroft Report. Fifteen teachers were supplied with a wide range of software and were then observed using it during a weekly lesson. Not surprisingly, the teachers chose software that was most obviously related to the curriculum and preferred structured programs rather than those of a problem-solving or investigative nature.

Since mathematics in the primary school is generally equated with arithmetic, there are many drill and tutorial programs available to assist the teaching of basic operations such as addition, subtraction, multiplication and division. The first primary school mathematics software was of this type and incorporated an initial placement test that started the student at an appropriate level in the sequence, then presented a lesson which had to be mastered before the student could progress to a higher level (Suppes & Morningstar, 1972). However, these programs have been criticised because they emphasise memorisation of rules and they are not related to real-life problems. Teachers who rely on these programs may neglect important mathematical thinking skills such as measurement, prediction, problem solving and estimation.

Nevertheless, it is necessary for children to become fluent in the basic number combinations once they understand the arithmetic operation itself. There are many 'arcade style' computer games designed to encourage children to practise number facts. At the Special Education Centre the children have been using the Developmental Learning Materials 'Academic Skill Series' to increase fluency of basic mathematics facts. These programs allow the user to enter material so that the facts can be organised to follow the teaching sequence used in the classrooms (add one, add two, add doubles etc.). These games allow the speed to be gradually increased and the older children particularly enjoy the challenge of trying to beat their previous score. The speed of recall of such facts has

consistently improved over several months of playing these games regularly (Outhred, 1985).

Innovative problem-solving software is becoming more readily available and some of these programs are specifically designed to improve skills that are considered important components of problem-solving ability. These are memory skills (for example, remembering sequences and matching), making discriminations, recognising attributes and learning rules. Cognitive control strategies such as looking for a pattern, eliminating possibilities and varying a single aspect at a time can be encouraged by the use of programs such as Code Quest or Pirates.

Logo is a computer language with which mathematical 'microworlds' can be explored. One such Logo environment is turtle geometry, where children, by entering commands to a computer, direct a robot turtle that moves around the floor or a small triangle that moves on the computer graphics screen. The 'turtle' can move forward, back, left or right, either drawing a track or leaving no trace. Commands can be repeated and amalgamated into a procedure that can be named and then stored to be recalled at another time. Logo has generated a large amount of research related to children's thinking about mathematical concepts. Noss (1985) studied 188 children aged 8 to 11 years for a period of one year and then selected 4 pairs of children for a further, more detailed study. He concluded that Logo programming provides primary school children with an environment in which they can do 'real' mathematics, that is, the children explore mathematical concepts in order to solve problems that they encounter when using Logo to produce a drawing or control other devices such as Lego. The content of this mathematical activity is based on geometric, numeric and algebraic concepts, while the processes developed involve exploration, planning, conjecture, testing and generalisation. Williams (1985) has designed Logo curriculum activities for children with special needs. The tasks include four stages and a computer is not necessary for the first three; exploring the real environment; creating a model environment; investigating the model environment. The final stage involves a simulation of the model environment shown on the computer screen and children move the 'turtle' to desired locations. The exploration of such an environment has been found to be particularly beneficial when combined with reading activities.

THE COMPUTER AS A COMMUNICATION AID FOR THE HANDICAPPED

Children with specific handicapping conditions integrated into a regular classroom may require specially designed hardware and software. For instance, children with low incidence, high severity conditions involving physical, visual or hearing impairments may predominantly use computers to assist in communication. Some common adaptive devices designed for this purpose are described below.

1) Input devices

There are a variety of alternatives to the conventional keyboard for entering information to a computer. The main limitation of such devices is that in general software is not designed to accept input from a non-standard source. As a result, software must be modified or specifically written to accept input from these devices. One such device that is particularly suitable for young children who have poor motor skills or when pictorial input is desired is a flat, touch sensitive tablet (e.g. Koala pad, Concept keyboard). An overlay can be positioned over the tablet and when a character on the overlay (picture, word, shape, symbol, etc.) is pressed, an area of the tablet is activated and this response is then interpreted by the program.

Many different switches are available for severely physically handicapped children, enabling them to choose options from a list or to select characters (letters, numbers, words, Bliss symbols) displayed on the screen. In this way children can communicate their needs or write letters that can be printed. Such switches may be activated by foot, hand, sound or eye gaze, in fact, by movement of almost any muscle as long as it can be reliably controlled to select a particular option. Another method of entering information is the mouse, a simple hand controlled device whose movement over a smooth surface is mirrored by a pointer on the screen. For example, to select a particular option the pointer is positioned over a box or 'icon' shown on the screen and the mouse switch clicked. Alternatively, a touch sensitive screen allows the user to select from a menu displayed on the screen by touching the required choice.

Voice-recognition systems have also been developed that accept words spoken into a microphone as input, identifying these by comparing them to a limited vocabulary already encoded in the computer memory. Developments in this technology have far-reaching implications for special education, as recently released voice-based learning systems can be 'trained' to understand a wide range of utterances. Such systems will have many applications for children with visual or physical handicaps, enabling them to improve their articulation or to more easily communicate with and control other devices, for example, computerised toys such as a robot 'turtle'.

Videotape and videodisc players can also be integrated with a computer to give an interactive system that can branch to different segments of tape or disc depending on a student's response to a question or a selection of choices. For example, a commercial American videodisc has a segment on teaching sign language for the deaf that can be included in a microcomputer lesson. Videodisc systems expand the range of visual possibilities to include not only computer graphics and text, but a variety of images, including film, video tape and photographs. While producing a videodisc master is expensive, accessing frames is almost instantaneous and these can be viewed individually, in slow motion or speeded up.

(2) Output devices

Output from a program is most commonly displayed on a screen or printed. However, for visually handicapped children, programs are now available that convert text to Braille and vice versa. Information from the computer can also be presented on a large screen in a magnified form or printed in Braille. Computers can also respond in a spoken form. This involves either synthesized or digitized speech.

Speech synthesis produces computerised imitation of human speech and such speech often sounds mechanical. The simplest systems come equipped with an established vocabulary of words, phrases and suffixes, with the provision of pauses for separating words and sentences. More versatile systems use phonemes or allophones (basic sound units of speech) to enable users to add new words. The speed of delivery and pitch levels can also be regulated in most systems (Harvey, 1983). Speech synthesizers are commonly incorporated into computers used by children with a speech disability, where the computer acts as an interpreter, and by blind children where the computer reads back information for verification. Digitized speech involves the coding of words and phrases (read by a person) into a form that can later be reproduced by the computer. This coded information can later be selected in any order and the quality of speech produced in this way is usually very good but the vocabulary is limited by the amount of computer memory available.

CONCLUSION

This chapter has suggested ways in which the computer may play an important role in the maintenance and integration of special needs children into regular schools, for example, by enabling the teacher to tailor aspects of the curriculum to a particular child's requirements or allowing a child the opportunity to practise specific skills. A computer, used as a communication device, may be essential for the integration of students with physical or sensory impairments into both school and community. Some computer applications, such as word processing, are relevant for all students but may prove particularly valuable for children with disabilities that impede written work, since, because of their impairment, much of their effort is concentrated on actually forming the letters and setting out the words on the page, rather than on the actual content. Writing with a word processor allows them to think about, and easily change, content and spelling. The computer may also display material that acts as a focus for group discussion or to motivate children by presenting activities in novel ways. However, in the future, computers will become commonplace teaching aids so it is important that we plan to use them effectively and consider how they may assist the integration of children with special needs into regular schools. While the Schools Commission has produced guidelines for the introduction of computers into primary and secondary classrooms, there is, as yet, no such information for special school and resource teachers.

Chapter 15

MANAGING INAPPROPRIATE BEHAVIOUR IN THE CLASSROOM

Meredith Martin

Inappropriate behaviour in the classroom is generally considered to include a large number of student acts which occur either too frequently or not frequently enough. Examples of excessive behaviours reported in the normal classroom include non-compliance, calling out, getting out-of-seat, physical agression towards objects or other people, verbal abuse of others and truancy. Behaviours which become a problem due to their infrequency or low occurrence are usually related to children's performance on set tasks, such as reading or number, but may also include withdrawn behaviours such as mutism and extreme isolation or fearfulness.

A large number of publications have dealt with strategies for reducing inappropriate behaviours (Alberto & Troutman, 1982; Kerr & Nelson, 1983; Sulzer-Azaroff & Mayer, 1977). The present chapter is concerned with general considerations for dealing with behaviour problems in the normal classroom and describes both informal and formal behaviour management strategies. This chapter will not expand on issues related to the process of increasing academic performance. Some useful sources on this latter topic include Blankenship & Lilly, 1981; Howell & Kaplan, 1980; White & Haring, 1976.

GENERAL CONSIDERATIONS FOR MANAGING BEHAVIOUR

There are a number of general considerations which should be noted before any behaviour management plan is implemented. These concern factors associated with the curriculum and the instructional environment, as well as the actual behaviour of students.

Many children respond to a poor curriculum by exhibiting excessive inappropriate behaviours. So one of the first considerations when dealing with problem behaviour is the nature of the curriculum at the time the undesirable behaviour occurs. Areas of curriculum

that could be reviewed include the level of difficulty of the content, the clarity of instructions given for set tasks, the relevance of the content to individual student's needs and the rate at which material is presented and a response expected. Of course, a review of these factors assumes, in the first place, that there actually is a set of program activities operating. However, given that the teacher has set tasks for the students, problems can still arise. For example, curriculum content may be inappropriate for a particular child, it may be too difficult, requiring skills which the child simply does not have, or, on the other hand, too simple, lacking enough interest to maintain the child's attention. Both of these situations can occur in classrooms where children are taught the same program in a lock-step method, each child moving through the content at the same rate as all other children in the class.

It is important for teachers to determine by thorough assessment whether the content of a curriculum is the cause of children's problems, since it is unlikely that any management program will maintain appropriate behaviour successfully if the level of difficulty of material being taught is wrong. Despite general agreement that teachers should routinely assess student performance and the outcomes of their instruction, consensus regarding how this should be done does not exist. Since commercially distributed achievement tests often fail to match the curriculum objectives set within a particular school, informal observation of performance appears to be the approach used and preferred by teachers (Deno, 1985). A reliable and valid alternative to standardized tests and to informal observations is curriculum-based measurement. This is 'the practice of obtaining direct and frequent measures of a student's performance on a series of sequentially arranged objectives derived from the curriculum used in the classroom' (Blankenship & Lilly, 1981, p.81). See Outhred and Center (this volume) for a discussion of this approach to assessment.

Another major consideration is the effect of the learning environment on classroom behaviour. Factors to consider here could include the physical setting, the people, and the arrangement of the activities in that setting. While a teacher may have little or no control over the choice of either a classroom or students, there are still several factors which may facilitate the management of children's behaviour in that class. Changes in the timetabling of activities have been shown to reduce inappropriate behaviour and increase attention (Krantz & Risley, 1977). For example, it is recommended that if attention to a group time activity is required, then it is better to precede this with an individual quiet activity rather than a vigorous one. Whaler and Fox (1981) noted that 'Manipulation of this type of setting event (i.e. by providing a rest period antecedent to the story reading period) was as effective as the introduction of contingency management procedures in the control of inappropriate behaviour' (p.330). Changes in the demands of the learning task have also been shown to have positive effects on behaviour management (Weeks & Gaylord-Ross, 1981). Tasks which are less demanding and where children work with relatively few errors are performed with fewer inappropriate behaviour than tasks which put greater demands on the students. Other instructional variables that have been shown to have an influence include the pacing of the instruction, the amount and type of feedback given to the students about their performance, and the sequencing of the examples in the instructional content.

The final consideration, although not the least important, includes the effects of inappropriate behaviour on the child involved and on others in the instructional environment. The teacher needs to determine the seriousness of the problem: for instance, is the behaviour interfering with the student's ability to learn, or with other children's learning; is it causing injury to the student, or others; is it causing other students and teachers to avoid that student? It may not be necessary to implement intrusive intervention strategies if none of these effects is observed.

In considering the effects of the inappropriate behaviour, account is usually taken of the frequency and intensity of its occurrence. For example, one day a student who is usually compliant may refuse to complete the work that he has been set, or may have a sudden, brief, but aggressive outburst. Infrequent behavour of this type should simply be monitored by the teacher to check that its rate of occurrence is not increasing. A simple diary record can be kept every time an instance occurs. In general, the introduction of a management program would not need to be considered unless the inappropriate behavour occurs frequently, lasts a long time, is performed with concentrated force and has the probability of continuing.

INTRODUCING A BEHAVIOUR MANAGEMENT PLAN

There is a whole range of options open to a teacher once a situation has been assessed, and it is decided that a management program is warranted. However, the aim of any strategy should be to have students learn to control their own behaviour in a manner acceptable to the given situation. The procedures for achieving this aim can be relatively simple if applied in a systematic and consistent manner. The objective of the remaining part of this chapter is to outline some examples of such procedures. The discussion will focus first on *Informal Solutions*, or strategies that are minimally intrusive, and then move on to *Formal Management Plans* which are considerably more intrusive and therefore less desirable within a regular classroom.

1. *Informal Solutions*:

   There are three main components of informal solutions to behaviour problems. These are:

   (1) activities or curricula which are interesting and at the child's performance level.

   (2) rules of behaviour which include a positive consequence for following the rule and a different consequence for not following the rule.

   (3) consistent application of the rules to create a predictable environment.

These strategies are largely preventative in function. They are not intrusive, are focussed primarily on positive behaviour, and have been shown to eliminate almost all behaviour problems in classes which were completely out of the teacher's control (Hotchkis & Lawson, 1984).

As suggested earlier, *curriculum* is perhaps the most significant factor in both preventing and controlling inappropriate behaviour in the classroom (Alberto & Troutman, 1982; Gaylord-Ross, 1980; Martin, Burke & Findlay, 1985; Thorley & Martin, 1982). Content should be carefully sequenced so that students can perform each task with minimum or no errors as they move through the material. Presentation should be interesting, well paced, and where possible, allow students to move at their own rate.

The second main component of informal solutions is to provide *rules of behaviour* for children to follow. These should be presented at a level that all the children can understand. Rules should be few in number (three or four), should be specific (Bailey & Wolery, 1984) and preferably stated in positive terms. For example, 'Hands up to talk' gives students some guidelines as to what to do, rather than 'No talking' which only tells students how not to behave. The rules must also be consistently enforced. To achieve this, the teacher must decide on some consequences for both compliance and non-compliance. Since the aim is to help children learn to behave appropriately, it is a good idea to have the

consequences for correct and incorrect behaviour as different as possible. For instance:

> A girl is praised for putting her hand up to answer a question. Another student does not put his hand up and the teacher says 'Put your hand up to answer'. The boy reluctantly does so and the teacher praises him.

In this example, the first student followed the classroom rule and received praise; the second student did not follow the rule, received a reminder, and was still praised. There was in fact little difference in the consequence for following, and not following, the rule. The teacher could have given the reminder, then attended to another student who did have his hand up, and then returned to the boy who had originally not followed the rule.

The rate of occurrence of following rules can be incresed by using positive reinforcement. Common reinforcers include adult attention, favourite activities, praise, food, drink, and special privileges. However, it is generally recognised that the older the student becomes the more difficult it is to find suitable reinforcers. Some that have proved successful for secondary-aged pupils include early dismissal from class, reduction of set work, privileges such as errands, extra time in a favourite class or activity, money, the right to select videos and/or computer games and computer use. One way to identify what may be reinforcing for a group is to have them compile a list of preferred activities and note them from 1-10. Children are more inclined to work towards earning something if they have been involved in the selection. In classes where students earned points towards such rewards, it is reported that the points themselves become the reinforcer, as students do not 'cash them in'. An astute teacher who observes the students in free time will usually find some object or activity which is appropriate to use as a reinforcer and good sales tactics from the teacher can considerably improve the reinforcing value of events.

Consequences for not following the rules in informal management programs are not usually severe, but may still have a range of intrusiveness. At the least intrusive level, there is the option to say nothing or not to attend to the student. The next level includes saying 'no' or reminding the student of the rule and then ignoring. More intrusive consequences include some response cost in the form of loss of some privilege, object or points; removal to another area for a set amount of time and removal from the given activity. The consequences for incorrect behaviour are usually selected because they represent a contrast from those that operate for correct behaviour as well as from what is available or easy to implement, and, most important of all, what succeeds in reducing the rate of occurrence of the behaviour.

A number of guidelines should be observed for implementing consequences for rule breaking. For example, when introducing consequences for not following rules, it is important to ensure that positive consequences are also used when rules are followed. It is often a common practice in the classrom to only notice students doing the 'wrong thing'. By consistently praising children who are following the classroom rules, and ignoring those who are not, classroom behaviour will usually improve. Another guideline is to fully inform the students of the consequences for rule-breaking. This avoids the situation where students will argue against 'injustice' when the consequences are implemented. Further it is important to praise the *specific* behaviour which is desired and not just the child. Teachers need to make the distinction between the child and the behaviour so that a reprimand is not interpreted as 'I don't like you', but rather, 'I don't like *that* behaviour.' Examples of specific praise include 'That's nice quiet waiting, Betty', 'Good, you raised your hand to answer'.

The final component of the informal behaviour management plan is the consistent application of the rules in the classroom. Consistency helps make an environment predictable and

this is particularly important for developing self-control in students. By providing a predictable environment, a student can learn the effects of his behaviour. For instance:

> Suppose Darren hits Josh. Sometimes other children laugh and yell out, the teacher comforts Josh and scolds Darren, or Darren is punished and asked to stay in at lunch time; and once in a while nothing happens.

This is an example of unpredictable environment, without clearly defined and consistently enforced rules. The offender is neither learning the effects of his behaviour, nor does he know what will happen when he hits another student.

Consistent responding to a behaviour includes both the reinforcing and punishing consequences, as well as the timing of the delivery of those consequences. Punishing consequences must be applied immediately after the inappropriate behaviour occurs, since failure to respond quickly and consistently may lead to other behaviours being reinforced or punished. This response must be at a consistent level for ***all*** children and not more extreme for those who are worse behaved. Sometimes, for a very difficult child, it is useful to set a goal for a number of positive interactions for a given time. For example, try to give the child eight positive statements about ***any*** appropriate behaviour for the first hour of the day.

Informal behaviour management solutions are designed primarily to *prevent* behaviour problems. Children tend to behave appropriately if they are engaged in well organised curriculum activities at their instructional level in a consistent, predictable environment. Wherever possible the teacher should implement such solutions before moving to formal procedures for controlling inappropriate behaviours.

2. Formal Management Plans:

There are times when, despite all attempts to provide relevant and interesting curricula and a set of consistently applied classroom behaviour rules, some students remain an enormous behaviour problem in the classroom. In such cases it is time to implement a formal behaviour management plan. Steps in the Formal Behaviour Program are outlined below.

Identifying and defining the target behaviour:

Target behaviour, or those which the teacher wishes to change, may include behaviours to be increased (completion of work, hands up to respond, making appropriate requests to peers), or decreased (tantrums, calling out, refusal to complete work. It is important that all such behaviours are observable, measurable, and defined so that two people can agree on their occurrence or non-occurrence, so that a criterion can be set for a desired level of performance. It is worth noting that, whenever possible, it is preferable to choose target behaviours to be increased, rather than decreased, with the emphasis on positive strategies and teaching appropriate and useful social skills. However, if it is necessary to select decreasing target behaviours, then a suitable *fair pair* (White & Haring, 1980) or behaviour to be increased, should also be identified. For example, if the negative target behaviour is running around the room, then the fair pair could be sitting quietly at the desk.

In many situations the selection of a target behaviour to change is easy. However, in other situations where a problem exists in a whole classroom, or where a student seems to have a large repertoire of inappropriate behaviours, the selection of a specific target behaviour is quite difficult. One technique that can be used to analyse social situations and thus iso-

late the problem is an Antecedent-Behaviour-Consequence, or A-B-C Form (See Fig. 1). This enables the teacher (or observer) to keep a record of the behaviour of the target child, and those behaviours or events which occurred immediately before (antecedent behaviour) and after (consequent behaviour) any inappropriate action. Such information can help identify specific behaviours which may need changing, but also isolate certain environmental conditions which may be contributing to the problem.

This technique can be used when behaviour needs to be observed in its social context. A major disadvantage of the procedure is that it is very difficult for teachers to observe in their own classrooms. A second observer, perhaps a resource teacher, an aide or an ESL teacher would need to act as the second observer. The technique is also too unwieldy to use as an observation format with more than one target child. Therefore, when a problem arises and more information is required, it is a good idea to use an observer to use the A-B-C Form during a period of time when the problem is most likely to occur, in order to pinpoint target behaviours for change.

Figure 1 Example of an Antecedent-Behaviour-Consequence (A-B-C) Form

TIME	*ANTECEDENT BEHAVIOUR*	*BEHAVIOUR (TARGET CHILD)*	*CONSEQUENT BEHAVIOUR*
9.16	*1.* Teacher (T): 'Get out your workbooks and get ready to write answers to these problems.	Darren (D) did not listen to T. continued to talk to child next to him.	T. repeated the instruction to Darren
	2.	D. walked over to pencil sharpener, bumped another child's desk—all the books fell to the ground	Child hit Darren
	3. Child hit Darren	D. hit child and swore at him.	T. 'Stop that, D.! or you'll have to leave the room.
	4.	D. continued to fight.	Other child now crying
	5. T. 'D, I said stop it immediately. Go to your own desk.'	D. went to pencil sharpener	T. 'I'm nearly ready to start now. Just waiting for D.'
9.25	*6.*	D. sharpens 3 pencils	T. 'Hurry up, D.'
	7.	D. returns to desk, tries to find workbook.	
9.30	*8.* 'Are you all ready?'	D. 'No, I can't find my book.'	

Once identified, the target behaviour is then defined so that anyone can observe, measure and reliably record its occurrence. Children's behaviour is often described in imprecise ways; for example, 'Billy is agressive'; 'Anna is disruptive' or 'Josey is lazy'. Such general statements are usually the reason for identifying and possibly referring the problem for further investigation. However, in order to implement and evaluate an educational management program, specific observable behaviours must be identified. A number of questions may help to refine the definition and arrive at possible target behaviours. For example, 'Billy is agressive':

What does Billy do that is aggressive?
When does he do it?
What is usually happening when he is aggressive?

Fig.2 shows examples of possible target behaviours and corresponding behavioural objectives for the three children identified earlier.

Figure 2 Identifying Target Behaviours and Writing Behavioural Objectives

PROBLEM	*POSSIBLE TARGET BEHAVIOURS*	*BEHAVIOURAL OBJECTIVE*
1. Billy is aggressive	share objects request assistance	Billy will share his toys and ask for help from the teacher at recess and lunch.
2. Anna is disruptive	hand up to talk in work periods	Anna will put her hand up without talking every time she wants to talk during all quiet work periods.
3. Josey is lazy.	complete set work	Josey will complete all set assignments before any free period is allotted.

Collect Baseline Data on the Behaviours:

Once the target behaviour has been defined in observable terms it is then possible to record any occurrences of that behaviour that are observed. This initial record of the behaviour that occurs prior to the implementation of change strategies (i.e. ***baseline data***) allows the teacher to both set goals and to evaluate actual changes in behaviour, once the program commences. Many teachers resist the idea of collecting any data on behaviour management programs, especially when there are so many other concerns in the regular classroom. However, if a child's behaviour is such a problem as to warrant 'formal' or structured procedures to change it, then objective data is the only way to efficiently evaluate the effectiveness of these procedures. Without such behavioural data, problems may persist longer than is necessary and it is difficult to determine why this is so, or which changes should be made to increase the effectivess of the procedures that have been implemented.

Baseline data will vary according to the characteristics of the target behaviour that is being observed. Often data is collected on ***frequency*** or rate (i.e. how often a behaviour occurs in a set period of time). For example, how often a child calls out or gets out of the seat are both frequency measures. Behaviour may also be described in terms of its ***duration***, or how long the behaviour lasts. Examples include how long a child is out of the seat or the duration of the temper tantrum. Another characteristic is ***latency***, or the length of time between the presentation of an instruction, or prompt, and the initiation of a response by the student. Latency is an important measure for children who are non-compliant; that is, those students who are slow to, or will not, follow a teacher's instruction.

The selection of the measurement strategy is partly based on the characteristics of the target behaviour and partly on the type of change that is desired. If the change is to increase the number of times a behaviour occurs in a set time period, (e.g. raising hands to respond), then rate should be measured. If the desired change is to increase the amount of time spent on a particular activity, then duration (e.g. number of minutes spent working on set assignments) should be measured. Some useful references on the collection and use of observational data to monitor changes in pupil performance include Alberto & Troutman, 1982; Cooper, 1981; Gelfand & Hartman, 1975; White & Haring, 1976.

There are some pitfalls in data collection which, if avoided, will help to eliminate some of the anxiety and negative attitudes that are often associated with classroom data collection. For example, it may be necessary to set priorities for behaviours which need monitoring,

such as those which are harmful or which prevent the student from participating in normal class activities. In addition, data should only be collected on behaviours which are intended for change. There is no point in collecting data if there is no plan for its use. Another common pitfall is the failure to respond to the data once it has been collected. A teacher may fail to look at the data when making decisions, preferring to act only on the basis of experience and subjective interpretations. Sometimes this occurs because the data is in a form which makes it very difficult to interpret. In fact, presentation of data may be as important as its actual collection. Graphic presentations are a preferred format, but even these may vary considerably.

Establish the Objective for the Targeted Behaviour:

Once baseline data are collected and charted, the next step is to determine the objective for that program. A well written behavioural objective facilitates teaching because it specifies the desired behaviour which the student is to exhibit in observable and measurable terms, the conditions under which the behaviour is to occur and the criteria for acceptable performance of the behaviour (Mager, 1962). Some examples of behavioural objectives with all three characteristics are:

When given a verbal request, Robin will begin to respond within five seconds.

Tess will arrive at all lessons within five minutes of the bell.

Jan will write answers in each maths unit of work with less than two errors.

The use of objectives will enable the teacher to determine the aim of the program and when it has been reached. It will also help the child to be clear about what behaviour is expected. A clear statement of desired behaviour has been shown to be sufficient in itself to obtain the terminal objective.

Design and Implement the Program:

In designing an intervention program, it is first necessary to select a strategy or strategies which, hopefully, will effect a change in the target behaviour. Again, a number of intervention options exist, including strategies to both increase and decrease the rate of occurrence of particular behaviour. Strategies that may be used to increase behaviours include positive reinforcement of the target behaviour, differential reinforcement of other behaviours, differential reinforcement of incompatible behaviours and contingency contracting. There are times when teachers claim that positive reinforcement does not work. Before abandoning the strategy, the following questions should be considered:

Is the selected reinforcer ***really*** a desired event? If not, try other activities, privileges, tangibles etc.

Is the reinforcer being applied *only* when the target behaviour is occurring?

Is the reinforcer being applied immediately the target behavour occurs?

Is the procedure being used consistently by all staff?

Are there more desirable events in the environment which may be competing with the selected reinforcer?

Differential reinforcement of other behaviours is a technique whereby any behaviour is reinforced other than the target behaviour to be reduced. For example, if the target behaviour is hitting, then the student is reinforced any time he/she is not hitting. Differential

reinforcement of incompatible behaviour is a similar strategy, except that the teacher reinforces the student when he/she is doing something that is incompatible with the target behaviour. For example, if the target behaviour is getting out-of-seat, then the incompatible behaviour is sitting-in-seat. Similarly, being quiet is incompatible with talking, and keeping hands to oneself is incompatible with hitting others.

Another positive procedure for reducing inappropriate behaviours is *contingency contracting* which is in effect a contract between a student or students, and the teacher (Homme, 1970). There are several advantages in the use of a written contract. For example, a permanent product is created which can be readily referred to by all parties, thus eliminating reliance on memory. The behaviour, of both the student and the teacher, is clearly stated and both are involved in negotiating the terms of the contract. This enables students to see themselves as active participants in the learning process. Homme (1970) suggests ten basic rules for the use of contracting:

1. The contract pay-off (reward) should be immediate.
2. Initial contracts should call for and reward small approximations.
3. Reward frequently with small amounts.
4. The contract should call for and reward accomplishment rather than obedience.
5. Reward the performance after it occurs.
6. The contract must be fair.
7. The terms of the contract must be clear.
8. The contract must be honest.
9. The contract must be positive.
10. Contracting as a method must be used systematically (pp.18-21).

Strategies to decrease behaviour in the classroom include reprimands, response cost, extinction, time-out and over-correction. All, except extinction, are defined as punishment procedures if, when applied immediately following an inappropriate behaviour, they have the effect of decreasing the occurrence of the behaviour. However, before describing *punishment* techniques, it is important to note some of the possible undesirable negative side effects of their use. Punishment is a poor model for children, in that it teaches the child what *not* to do rather than what to do, and may result in a general reduction of all behaviour, both appropriate and inappropriate, and lead to the child's avoidance of any interactions with the teacher. Nevertheless it may still be necessary to use punishment strategies. Punishment should always be used in conjunction with positive strategies and the number of punishing stimuli should be much *lower* than the number of positive strategies. It may be necessary to check that this ratio is operating, since the use of punishment, rather than positive strategies, is more frequently observed than vice versa, in most regular classrooms where problem behaviours exist. A simple tally mark for positive and negative comments will determine the ration.

Reprimands, or aversive verbal consequences, should be used with caution, since they do represent teacher attention, and may prove positively reinforcing to students. The manner of delivery of the reprimand is an important consideration. O'Leary, Kaufman, Kass and Drabman (1970) found that soft, private reprimands were more effective than loud verbal aversives in reducing the disruptive behaviour of primary-age pupils.

Response cost procedures involve the loss of a reinforcer, contingent upon the occurrence of an inappropriate behaviour (Kazden, 1972). The loss may involve an activity, or a token representing some tangible object or privilege. Caution must be taken when removing

points to ensure that the offender does not receive reinforcing attention for some offence. In addition, arrangements to earn points must appear to be attainable and it is strongly advisable to negotiate with the student about the systematic use of response cost.

Time-out, or contingent loss of the opportunity to obtain positive reinforcement, is possibly one of the most frequently used, yet misunderstood, procedures for reducing inappropriate behaviours in the classroom. There are three options to time-out:

contingent observation, where the student remains in the classroom, but loses the right to receive any reinforcement from the activity where the inappropriate behaviour occurred.

exclusion time-out, where the student is removed from the activity for a short time.

seclusion time-out, where the student is removed and confined in an isolated space. Seclusion is very often regarded as the only form of time-out, yet contingent observation and exclusion from an activitly can be equally effective.

Some features of time-out are often misunderstood. First, the activity from which the child has been removed must in fact be reinforcing. The child must prefer the activity to the attention received in enforcing time-out procedures and to time-out itself. Secondly, the duration of the time-out period must not be neglected. Shorter periods of one- to-five-minutes have been shown to be as effective as longer periods, provided students have not had previous exposure to longer periods (White, Nielsen & Johnson, 1972). Thirdly, (and this applies to all techniques) the collection of data to monitor the effectiveness of time-out procedures will serve as a check on the previous two cautions.

Restitutional *over-correction* and *positive practice* have been identified as two types of over-correction appropriate to use in an instructional setting (Sulzer-Azaroff & Mayer, 1977). Restitutional over-correction requires the student to correct the consequences of behaviour and return the situation to a condition better than before the inappropriate behaviour occurred. (e.g., students must scrub all desks in a classroom for damage done to one). Positive practice requires the student to repeatedly practise a positive behaviour incompatible with the inappropriate behaviour (e.g. repeatedly raising a hand before speaking in class).

Over-correction procedures have been researched more extensively in controlling undesirable behaviours among students with severely handicapping conditions than with behaviour problems in group situations such as the regular classroom. Nevertheless, the procedures are emerging as a viable possibility when other strategies fail. Bailey and Wolery (1984) have suggested some gidelines which should be followed in designing any over-correction program:

1. Design the over-correction procedure so behaviours required are directly related to the child's inappropriate behaviour. For example, if the inappropriate behaviour is throwing objects, the behaviour required may be picking up objects.
2. Tell the child what constituted the inappropriate behaviour. The teacher should stop the child, and firmly say, 'No. . . . . (inappropriate behaviour)'.
3. Apply the over-correction procedures immediately after the inappropriate behaviour, telling the child what he or she did wrong.
4. Do not allow any reinforcement to occur during the time the over-correction is actually being implemented. The child's behaviour should be allowed to continue without reinforcement.
5. Return the child to the on-going activity. When the child has behaved appropriately, he or she should be reinforced (pp. 250-251).

Extinction is a technique where the reinforcement for performing a given behaviour is removed. For example, when a student answers without putting a hand up, the teacher does not respond to that student. There are several cautions which must be noted if considering extinction as an intervention strategy. First, the reinforcer which is maintaining the target behaviour must be identified and must also be able to be removed. For example, if a student

is acting out in class, removing teacher attention may not be sufficient if in fact peer attention is also maintaining the inappropriate behaviour. Ignoring is frequently equated with extinction. This is only the case if the person doing the ignoring is the one whose attention is maintaining the behaviour. A second consideration is that extinction is often slow to work, and may even result in an increase in the inappropriate behaviour before gradually reducing it. Thus, to use extinction effectively, the source of reinforcement must be identified, be able to be removed, and the procedures must be applied consistently and for a long enough time to have the desired effect.

Evaluate the Data

Evaluation of the data is necessary to assess the impact of the management procedures on the student's behaviour. The evaluation may occur after the program is completed (summative evaluation), or while the program is being implemented (formative evaluation). One advantage of evaluating the program regularly is that changes can be made to the procedures immediately if and when a situation deteriorates. Problems with the management program may be simply changed with a switch in the type of reinforcer, the amount of reinforcement, or the instructional material while a program is in progress. If left to evaluate at the end of the school term, the problem may be so severe that major interventions will be necessary.

As with the graphing, the interpretation of the data can be made in ever increasingly sophisticated ways (Deno & Mirkin, 1987; Liberty & White, 1980; White & Haring, 1976). For more detailed analysis the reader is referred to these sources but some simple rules are given below.

After intervention procedures are introduced, the data can indicate any of the following effects of the procedures on the target behaviour:

1. There may be *no change*, that is, the procedures made no effect on changing the target behaviour. If this is an undesirable situation it is suggested that a change in some aspect of the procedures will be necessary.

2. A *change in the general trend* of the data may occur, indicating that, overall, the behaviour is increasing or decreasing. If the change is occurring in the desired direction and quickly enough, then no change to the procedures is recommended.

3. A further effect may be a *change in the stability* of the data, indicating either more or less variable performance by the student. In most cases, less variable performance is desirable and, if this is the case, there may be no need for any changes in the management strategies. On the other hand, increased variability is usually undesirable and a change may be indicated. Haring, Liberty and White (1980) have suggested a number of strategies for highly variable performance. These include, changing the curriculum content by moving to more difficult material or to the next step in the program. In cases where poor curriculum or no curriculum is in effect then a concerted effort in this area is strongly recommended. Another suggestion is to change the reinforcer to one that is more desirable.

4. One last effect of intervention strategies may be a *change in the level of performance*. For example, if, prior to any strategies being implemented, the behaviour occurred ten times per minute, a level change would be indicated when, immediately following the intervention, the behaviour dropped to five times per minute or increased to 18 times per minute. As with changes in the trend, if the behaviour has shifted to a desirable level then no change is recommended, if not, then some change should be made.

Modify the Program if Necessary:

Changes to a management program are necessary when the data indicate that no improvement is occurring or that the situation is deteriorating. The decision of when to change the program is usually not as difficult as deciding what to change. While the number of options for change may be extensive, a teacher is often restricted in the choice by time, money, personnel and resource limitiations.

A few rules of thumb may assist in the decision making process. Look first at antecedent events surrounding the behaviour. Are there *clear* directions of what is expected both in the curriculum and in the behaviour? Is the curriculum at the child's correct performance level? Are there any interfering variables occurring during the same time?

Once antecedent difficulties have been ruled out, consider any consequent problems. Is the selected reinforcer in fact reinforcing? Is the reinforcement being given enough or too often? Is the reinforcement specific to the target behaviour or is the student constantly being told 'Good Girl'? Is the punishment in fact punishing? Is an effective reinforcer being used with a punisher? And most important of all, are the management procedures being applied *consistently.*

Monitor the Behaviour to Check Maintenance Over Time:

Once the children are performing at the desired level of acceptable behaviour it is easy to relax and consider the problem 'solved'. In some instances this may be so. But, in others the end to the problem is not so obvious. While a relaxation or fading out of the more intrusive measures is desirable, careful monitoring of this process is still advised. Slowly transferring the control from the teacher to the students is a positive step. Once you have reached this stage, students can be encouraged to monitor their own behaviour (Workman, 1982). Similarly the behaviour monitoring can be gradually reduced to more intermittent checks. Regular checks will prevent a return to the undesirable situation and less intrusive measures can be introduced on a preventative level, rather than allowing the problem to escalate again.

CONCLUSION

All teachers experience the problem of dealing with children who display inappropriate behaviour. The purpose of this chapter was to outline some procedures which, if applied systematically, will reduce the occurrence of such behaviours. The procedures include both informal and formal strategies. Informal strategies should always be operating in classrooms: they include providing a predictable environment and suitable curriculum activities for all children. Formal strategies, in addition, include the use of positive and/or aversive consequences. Specific guidelines and cautions are outlined for the use of the more intrusive strategies.

The task of bringing so-called 'uncontrollable behaviour' under control is at times a daunting task. Yet the process is clear: carefully identify the target behaviours; objectively collect data on the target behaviours prior to implementing any strategies; establish the terminal objective for the behaviour; systematically plan and consistently implement the program; collect and monitor the data while the program is underway; modify the program if necessary, and finally, fade out the procedures while continuing to check for the maintenance of the desirable behaviour over time. *GOOD LUCK*

Chapter 16

THE ROSAMUNDE/AMBROSE LETTERS: SETTING UP AS A RESOURCE TEACHER

Joan Jardine

Rosamunde Schuss has received her first appointment as a resource teacher at an inner-city school. She has limited experience as a primary teacher, and has just completed a postgraduate course in special education.

The teachers at Rosamunde's school know that most of their children are not successful readers, but they can express their dissatisfaction only in vague, global terms. Rosamunde does not have the knowledge, or the experience necessary for identifying specific problem areas and treating them. She writes to one of her former lecturers, asking for help.

These letters are not comprehensive, in that they do not cover all aspects of reading K-6. Rather, they deal with those issues where Rosamunde and/or her lecturer, feel that she needs assistance. The main issues are:

- the selection of a model for reading in the Infants school—minimal objectives, structured, phonic based
- developing fluency
- comprehension—content, or semantics; syntax; metacognition.

LETTER 1—from Rosamunde Schuss, resource teacher, Waratah Grove Public School, to Ambrose Hupnaught, Lecturer, Banks University
—in which the ethno-socio-economic background of the school is described; its reading achievement scores listed; staff attitudes outlined.

4th February

Dear Ambrose,

. . . and so, Ambrose, I suppose that my biggest surprise was the racial homogeneity of the school. I had heard that Waratah Grove was like that—a small pocket of streets and lanes occupied by the same families, who mainly worked at the biscuit factory that extends over several acres of the suburb.

I am really stressed about their reading. My predecessor was heavily into assessment (well, it's one way to fill the day when teaching seems too hard)—although, to be fair, she

did service those kids who demonstrated a 2+ year disparity between M.A. and R.A.[1] using a withdrawal system[2]. Unfortunately, there were so many clients, they were seen once a week only. Anyway, the fortunate aspect is that I have a pretest of the reading age of every kid in the school, and here is a summary:

> ACER Primary Reading Survey Tests:
> In every grade, at least 80% of children below average on N.S.W. State norms
> Mean (across grades)—89% below average
> Range (across grades)—81-98% of children below average
> In each grade, at least 30% of children were on stanine 1[3] (Thorley, 1976).

The figures are stable for the last six terms, before which there was no consistent documentation of reading achievement.

We have had one staff meeting so far, at which we have wrung our hands, individually and collectively, about the children's reading achievement, or lack of it, and the factors to which it may be attributed. Certainly, the staff here are well aware (too well aware?) of the contribution made by socio-economic factors. And yet, along with their defeatist attitude, I sense that the staff here are well-intentioned, good-hearted people, who do want to change the nature of child-book interface, but so far have not hit on a successful set of methods. I also strongly suspect that they are looking at me, and that if I do not deliver some goodies, soon, I will have missed my chance here.

And now I, in turn, am looking at you, Ambrose. What has come as a shock is that I am expected to know it *all*—reading from K. to 6—not just the areas that were my essay topics. I am very aware that my university training has given me spotted proficiency, only. Hence this letter; rather than throwing the job in, I thought that I will write to you instead, about those aspects of reading where I don't know the answer. The first question is: Where do I start? What do I do? How do you implement those elegant experiments in a complex, chaotic, contaminated, real world setting?

LETTER 2—from the same to the same—

in which the school personnel are described in more detail and Rosamunde worries about lack of executive support.[4]

16th February

Dear Ambrose,

I really appreciated your taking my request seriously, and attending to it immediately. You asked for some information on the powers-that-be.

a) The Head retires at the end of term, and most of his thoughts are directed towards that happy event. While he will not counter any proposals (within reason) that I make, he will not be particularly supportive.

b) The deputy takes sixth class (did I mention that there is only one class per grade in this school?) and appears to run a trim, tidy ship, in terms of time spent on task. As far as reading is concerned, the task appears to be

- the children take turns in reading from the school magazine, while the rest of the class read along silently. (Considering that the damaging effects of this method on reading strategies were demonstrated over thirty years ago[5] I was really surprised to see it still being practised);

- plus private reading of classroom library books for about ¾ of the class, while
- he works with the other ¼ in a last ditch attempt to teach the Dolch List[6], both for reading and writing (Busby, undated). Much of his energy is directed towards behavioural problems in the school, and on cutting down the truancy rate. (Each week, he spends several lunchtimes touring likely hang-out spots for truants—his class have their lunch break at surprising times). His success rate is measured by the number of children who return with him from these forays. Records show that the truancy rate is increasing and I am not surprised, considering the excitement injected into it by the deputy. No, this is not irrelevant, Ambrose. I am trying to convey where the energy of the executive is directed, and it is not towards the reading program.

c) The Reading Consultant is, naturally, extremely busy. Her priorities are the establishment of the D.E.A.R. scheme[7] in schools in her district, and the preparation of applications for D.S.P.[8] money. Will the D.E.A.R. scheme help? It is not yet implemented here, because the Deputy's moveable lunchtime precludes a certain period being set aside.

In short, the executive will be neither supportive, nor obstructionist, as long as I don't make waves. This situation, interpreted in the light of Samuel's (1981) and Hoffman and Rutherford's (1984) findings,[9] is inducing a state of inertia in me.

LETTER 3—from Ambrose Hupnaught to Rosamunde Schuss—

in which Ambrose puts Rosamunde's problem in perspective; takes a swipe at the D.E.A.R. scheme; gives some gratuitous advice and presents Rosamunde with her first big choice—the model of intervention.

22nd February

Dear Rosamunde,

Perhaps you are too close to the situation to see things in proportion. Samuels (1981) and Hoffman and Rutherford (1984) were talking about total reading programs, implemented, at the least, across the whole school, and involving changes in personnel distribution, equipment, methods, instruction and measurement. They refer to 2 year preparation periods (for the successful projects). You, alone, cannot design and implement such a program, and I am sure, on reflection, that you can see this. What you can do, is to modify (either haphazardly or systematically) what already exists. Samuels (1981) and Hoffman and Rutherford (1984) did not address this issue—of working within an existing system, to improve that system—and so their findings are suggestive, rather than mandatory. You say that the staff seem well-intentioned, although disheartened and dispirited. Very well—there is scope for you. But first, let me clear a few other matters out of the way.

The D.E.A.R. scheme: do as you wish, my dear—there are pluses and minuses both ways. Your decision should be guided by your main purpose. If it is to provide practice time in reading, well and good—at least some of them will practise, some of the time. However, when people talk of the D.E.A.R. scheme as promoting a love of reading I recall a similar practice from my youth: on the last stroke of twelve noon, we would all chant the *Angelus*, for the same mixture of pragmatic and idealistic purposes as characterise the D.E.A.R. scheme. Even then, it seemed to me that the element of coercion alienated the very people for whom coercion was necessary. As to the teacher's modelling the desired behaviour—well, that works for the goody two-shoes, but we are not talking about them, are we? (I always enjoy talking about issues like the D.E.A.R. scheme; the debate is still at the level of gut feelings, so emotion, rather than reason, can run rampant).

And now, let me indulge in one other piece of gratuitous advice, completely unsupported by empirical evidence. It seems that the classroom teachers, although temporarily depressed, want, like you, to improve the children's reading performance, rather than to demonstrate their ideological purity. Cloistered as I am within metaphorically ivy-covered walls, I would not presume to offer advice on such practical issues as your face-to-face encounters with the staff, except for this: endeavour at all costs to avoid confrontations based on theoretical issues, and the polarisation which frequently follows—a contemporary problem in reading. I am not saying that a coherent stance is unimportant; it is essential that you develop a coherent approach. What are unimportant, it seems to me, are the ideological credentials of the authors on whose works your position is based. In fact, 'works' (in the sense of evidence), rather than belief, is your watchword. Similarly, terminology can be divisive. The concept, not the label, is what you must endeavour to communicate. In the interests of good communication, use those terms which are most meaningful to the other person, but, at the same time, perhaps through copious examples, ensure that you are both talking about the same concept.

Having got that off my chest, let me turn to more immediately relevant matters. How can you have the maximum impact on the reading performance of the school? There are two main factors: limitation of time and space (one person can only do a finite amount) and the credibility issue. By this, I mean that one of your main tasks, in this your first year, will be to convince the staff that you have something to offer. Hence your input must be perceptible, and successful. You will increase your chances of demonstrable success if you target on one limited area rather than scattering your shot across the whole school. For these reasons, I would strongly recommend that you concentrate your energies on the kindergarten class and implement the zero-exclusion,[10] minimal objectives[11] model (Thorley, 1976, 1976a), in an effort to break the spiral of failure that presently exists. In presenting the plan to the staff you could emphasise the following features:

The Goal

To reduce reading failure to zero in the kindergarten class this year, and in each subsequent class in subsequent years. This Kindergarten class will be the class that changed the pattern of reading scores at Waratah Grove.

The Approach

1. The establishment, by staff discussion and consensus, of a set of minimal objectives—i.e. 'minimal performance standards that each and every child shall learn' (Thorley, 1976, p.31).
2. Adequate provision to ensure that all children maintain progress—i.e. no children are to be held back, or given pointless busy work.
3. Flexible scheduling of school time and personnel, and the utilisation of community and peer volunteers (Cooper, 1984), to ensure that the goals are reached (work on the Infants Mistress for this one). You, yourself, will work side by side with the regular Kindergarten teacher to get the program started, of course.
4. On-going curriculum-based measurement to demonstrate progress both to teachers and children.

As you can see, its the old mastery-learning model[12] (Carroll, 1963; Bloom, Hastings and Medaus, 1971; Bloom, 1984) combined with a zero-exclusion policy (Brown, Crowner, Williams, York, 1975).

The advantages to the children and teacher in Kindergarten are obvious. Other teachers will have their gratification delayed, but it will come, when they come face to face with a class in which there are no total failures. The class will never be homogeneous, but at least you can ensure that there is no ghastly tail straggling down to near zero. Hence, programming in future years will be simpler.

As to the children in other years: this year, you will be offering them very little, or nothing. It's a hard fact, but face it . . . and after all, spreading yourself thinly does not make much sense. Look at how dissatisfied people are with the present model. However, once your new approach is under way, it will become self-sustaining, and you can attend to other aspects of the school's reading program.

The advantages to you are obvious: if you change the pattern of reading achievement in Kindergarten, you have demonstrated the credibility of yourself, and the model and methods you espouse, consequently increasing your influence in

the school.

Finally, and you need not make this point public, you will have given the school, particularly the Infants section, an achievable goal (but for heaven's sake, don't let them set unrealistic minimal objectives) and you will work with them to achieve it. In doing so, you will engender commitment and enthusiasm. See Samuels (1981) for the importance of those qualities.

Of course, the model assumes a structured approach to reading[13], i.e. one that focuses on content, rather than motivation. I would choose the structured approach, in your situation, for the Infants classes, for the following reasons:

1. Older children at this school have a history of failure. It is reasonable, then, to regard the present beginners as 'at-risk'. A structured approach has been shown to be effective with children of this type (Becker, 1978; Rosenshine, 1976; Rosenshine & Stevens, 1984). Chall (1983) thinks that this is because 'the relations between sounds and letters, elementary decoding skills[14], are usually not discovered by the learner, but require direct instruction' (p27), in contrast with later reading stages, where progress is possible through private practice. Another reason for its success is that it facilitates each student experiencing high success rates in that skill levels, rather than interest factors, determine the content of each student's lesson, and high success rates are both a motivator, in themselves, and are associated with high achievement rates (Berliner, 1981).
2. The weaknesses in a structured approach seem to be mainly that the content material may not, in itself, be motivating. However, at the infants level, this disadvantage is easily overcome (or more easily overcome than problems associated with other models) by providing successful experiences. Infants teachers seem particularly effective at making these situations rewarding.

LETTER 4—from Rosamunde Schuss to Ambrose Hupnaught—

in which Rosamunde is confused about the meaning/decoding issue.

26th February

Dear Ambrose,

About the necessity for a structured, systematic approach, you have convinced me. But I am still not totally clear about the content, and method. Your reference to Chall (1983) implies that at least some phonic skills[15] will be directly taught. But why? I had thought of building up their language, and focusing on the meaning of print. When I was teaching at Eucalyptus Heights, the kids just seemed to work out the phonic rules themselves.

LETTER 5—from Ambrose Hupnaught to Rosamunde Schuss

—in which Ambrose provides arguments for the early introduction of phonics[16] and considers its effect on later comprehension.

4th March

Dear Rosamunde,

Waratah Grove is not Eucalyptus Heights. Your main aim is to prevent failure, so you must play it safe. You probably left university before *Handbook of Reading Research* (Pearson, 1984b) was available. Johnson and Baumann's chapter on Word Identification reviews the literature to date and leaves little doubt about the effectiveness of 'programs emphasising early, reasonably intensive phonics instruction' for 'producing readers who are more proficient at word pronunciation' compared with 'programs emphasising meaning' (p.594). They quote Resnick (1977, p.7): 'this is especially true for low socio-economic groups and for low achievers in general' (p.592). Your remarks about 'building up their language' should be tempered by Chall's comment on poor readers (Chall, 1983, p.29): 'generally their ability to derive meaning from print lags significantly behind their ability to understand by other means. Their difficulty is usually not with understanding idea or language,' but with decoding and fluency (her stages 1 and 2)[17].

However, although there are numerous studies demonstrating the effectiveness of code-emphasis programs for word recognition, none of them has demonstrated a superior effect for comprehension: 'when comprehension beyond the very simplest level is the criterion, there is no clear advantage for either code- or language-oriented programs' (Resnick, 1977, p.7). I would still recommend a (phonics) code-emphasis program, however, because if a child fails to comprehend, after cracking the code successfully, then at least you have excluded one possible reason for failure, and can turn your attention to other factors. Stanovich (1980) has written convincingly of the important part which word identification plays in the total reading act. A program with a strong phonics component will be more effective, at this stage, in teaching word identification—the conclusion is obvious.

LETTER 6—from Ambrose Hupnaught to Rosamunde Schuss

—in which Ambrose describes the points at which meaning—and code-emphasis programs differ.

10th March

Dear Rosamunde,

How nice to hear your voice on the phone! I am sorry that I could not discuss your problem, but the Camberwell Campanologists practise at my place every Friday, so, instead, here is a letter.

In the sense in which you describe it, one can emphasise both decoding and meaning, given enough time spent on reading, but there is one important point at which a choice has to be made, and that is—how will you advise a child who baulks at a word in context? A decoding approach demands that you ask him to sound it out; a meaning approach demands that you ask him to consider the context, and predict. As the children become more mature readers, they will know which of these strategies to apply in a given context. Stanovich (1980) describes clearly the way that we, at different times, use each of these strategies, but you will not be teaching them how to make this decision right now. Hence, the choice between decoding and meaning becomes very real, at this stage. If you are teaching phonics, those are the skills you will direct them to use, for unknown regular words.

This is not to say that you never direct the children to review the meaning of the text. At the end of a sentence, or at the end of a page, it can be useful to say, 'Does that make sense? What's it about?' as a check on comprehension. If this stopping and checking is then internalised by the students, the fact that print has meaning for them, is emphasised. There is no real evidence for this procedure, that I am aware of, except the work done by Paris, Cross & Lipson (1984), on older children, and their results were suggestive rather than compelling, but why not try it?

There is one other point at which a choice has to be made between a decoding and a meaning approach, and that is the number of regular words in the children's readers. Juel and Roper-Schneider (1985) have demonstrated that phonics lessons are more effective when the children's readers contain a high proportion of regular words[18], than when the readers contain a lower proportion of regular words. This finding concurs with all that we know about practice, and its effect on acquisition (Rosenshine & Stevens, 1984), and, as well, with Stokes and Baer's analysis of generalisation training[19] (1977). If our goal is, ultimately, to teach children to read in context, then we should be addressing the issue of transferring, or generalising the skills they acquire in a structured phonics lessons, rather than adopting a Train and Hope approach (Stokes and Baer, 1977).

LETTER 7—from Rosamunde Schuss to Ambrose Hupnaught—

in which Rosamunde talks about the implementation of her program, the teaching of auditory skills, the importance of controlling the difficulty of the task and relates some anecdotes.

3rd May

Dear Ambrose,

The end of first term is approaching, and I am feeling much happier and more purposeful than I did at the beginning. Thank you for your part in the conversion process.

I had not realised that 'minimal objectives' was such a radical concept! Several meetings with the staff, as well as chats at lunchtime, were necessary before they appreciated that we were not throwing our standards out the window, nor were we proposing to abandon the more able students, or to force them all into a lock-step formation. Once those hurdles were overcome, there was a mood of enthusiasm, particularly for two features:

- the clarification of exactly what we were trying to do, and
- a positive feeling that the poorest readers were being catered for, and that an achievable goal was to be set for them.

The teachers of the higher years were happy that their programming would be simplified in future, since they could assume that all students had reached a certain criterion. This feature softened their initial resentment that so much of my time would be devoted to one class, this year.

Setting goals was the concern of the whole staff, although infants teachers had the most input. They were so ambitious! I said very little, as the decision had to come from them, but I put a large sign on the wall: 'Minimal objectives—those skills which will be achieved by *all* children.' Their final decision was:

- 40 sight words—a combination of meaningful words (Ashton-Warner, 1963)[20] and the words in their first reader,
- all letter-sound combinations, using the short sounds for the vowels,

- all cvc combinations (c/f Thorley, 1976).

Considering the history of reading achievement in the school, this is an ambitious program. However, everyone is keen to make it work (for the moment) and the Infants Mistress is working on ways to increase our manpower, using her contacts in the district as a source of voluntary labour. The Deputy has offered the services of his sixth-class children, as tutors, and has tied in this offer with his anti-truancy program—children who truant are excluded from tutoring for two weeks. It is too soon to tell how that one is working out! But certainly, we need extra manpower—Bloom (1984) has convinced me of that.

Speaking of Bloom, I have not said anything in staff meetings about the whole issue of engaged time,[21] grouping,[22] direct instruction,[23] formative testing[24] and so on (Rosenshine & Stevens, 1984; Berliner, 1981) because the staff themselves have not raised these issues yet, and demonstration is a more convincing method than description. I will be working in the classroom and implementing those principles in my work, in cooperation with the regular kindergarten teacher who is keen to try them. As the Infants Mistress has scheduled a period for herself and the first grade teacher to be in the kindergarten classroom, once a week, they can observe how the system works in practice.

So, right, now, here I am, getting my hands dirty. The regular kindergarten teacher and I have worked out our program together: her main responsibility is the more able children, who must be kept moving, and the whole class enrichment activities (stories, language work, drama), and mine is the slower ones, who compose over half the class.

We used Share, Jorm, Maclean and Matthews' (1984) short set of five predictors[25] as a quick screener, although I found their best predictor—phoneme segmentation—to be of little use as a discriminator. Helfgott (1976), from whom they derived their phonemic segmentation task, gave her pre-first grade children four days of training and testing, and found that 'many children had great difficulty and many had no difficulty whatsoever' (Helfgott, 1976, p.162). Eleven of her 31 children scores less than 25% correct, and 9 of them scored zero, but then, 9 scored 76+%. We did not have any high scores, but a cluster around 10% correct. Given that the test takes as long, or longer, than the other 4 put together, and that it was a painful experience for all concerned, I think I will drop it in future, and just start teaching phonological skills to all the children. Because I am monitoring their progress, those children who already have well-developed phonological skills can move rapidly into the phonic group, while the others receive as much phonemic segmentation and blending instruction as they need to bring them to criterion.

I notice that McGinitie (1978) thinks that while 'literate adults have already developed the conceptualisations that allow them to represent complex intertwined sound signals as a very simple series of abstract elements' (p.53), for children, the whole process, including the phonemic elements, is very abstract, and hence, difficult. Nevertheless, convinced of the importance of phonological skills,[26] I searched for a good program for teaching them. Carnine and Silbert (1979) had the most carefully sequenced approach, I thought. I particularly liked the way they structured both segmentation and blending, and combined these skills with the introduction of letter sounds (from easy, or continuous sounds to hard, or stop sounds). Most importantly, they stressed the necessity of not pausing between the sounds in a word, in segmentation and in blending (i.e. 'ssaat', not 'ss-aa-t') and of insisting that children do not pause, either. I think that this element is of crucial importance, if a phonic approach is to make sense to children, and that some of the failures in the past can be attributed to the fact that:

1. some children could not perceive any connection between segmented sounds, with pauses between them, and the word,

2. the early examples, when children were first developing their concept of what the process was about, used stop sounds as the initial sound (e.g. 'kuh-aa-t'). Chomsky (1978) appears to concur on the meaninglessness of poor sounding-out practices.

A crucial issue appears to be controlling the level of task difficulty. If I move too fast, they rapidly become fidgety, inattentive, and then start making mistakes on work they could previously perform correctly (Hively, 1962). Similarly in teaching sight words[27], one feature of our program that appears to make a difference is the controlled rate at which we expand their words. Words are first taught in isolation (Singer, Samuels and Spiroff, 1973) and a variety of methods are used to help children form the associations between the printed word, its sound and its meaning (Wulz & Hollis, 1979). We ensure that they are never overloaded, by a quick review, several times a day, of words previously learnt, particularly those learnt in the last fortnight (Fink & Brice-Gray, 1979). Systematic, cumulative review, as well as giving them the practice, demonstrates both to them, and to us, exactly how much they have learnt and moves them closer to the automatic recognition so important in reading (Stanovich, 1980). As their chances of getting all their words right are high, and we try to generate an air of excitement, they are really keen to engage in what might otherwise be boring drill work.

This approach meshes well with a basal reader series[28] that controls the rate of word introduction. After they have learnt the words in isolation, they can read the books. Fortunately, the Infants Mistress has ensured that there are several volunteers, each day, waiting to hear children read.

Other members of staff are showing initiative. The first grade teacher has applied for a D.S.P. grant to convert an unused room into a reading room. There is a regular reading segment at Infants school assemblies, when teachers or children read a book to the assembled. I sense an air of hopefulness.

LETTER 8—from Rosamunde Schuss to Ambrose Hupnaught

—in which Rosamunde reviews the year's achievements and raises a new set of problems.

16th November

Dear Ambrose,

We had a staff meeting which reviewed the reading program in kindergarten. No standardized scores[29] were available, as I argued that testing should be done next February, to measure their performance as maintained over a period without instruction, and because we would then have a more realistic basis for first grade planning. For the same reason we will readminister our curriculum-based tests then, too.

The Infants staff now seem to be positively disposed towards the model. I think the fact that they could observe its development, and project themselves into the role of teacher, greatly contributed to their acceptance. Towards the end of the year, when 5 children were some way from attaining all our minimal objectives, the first grade teacher was particularly involved. Whenever she was not totally involved with her own class (sport, craft, etc.) she would grab one of the 5 and work with him (and its always a him, isn't it?). Because of our specific objectives, and daily record sheets, she could see at once what had to be done, and she had observed our methods sufficiently to use an approach consistent with ours. That 3 of the 5 made it (c/f Thorley, 1976) in the last fortnight, can be attributed to her.

Certainly, she is happy for the model to be continued in her class next year, and we have already had some discussions about programming and materials. However, I can see that my involvement will not be as total as it was this year, as the Infants staff, in particular, and,

to a lesser extent, the rest of the staff, are now convinced not only that it is important to spend time on task (Berliner, 1981), but that instructional and management skills must be used to ensure that time is used to maximum effect (Berliner, 1981; Rosenshine & Stevens, 1984). For this I can take some credit, in that I raised the issues of setting goals, working out our systematic lesson plans, measuring progress, etc., and modelled those skills, but a large contribution was made by the other members of staff, who were willing, and then increasingly keen, to try and make this model work.

Our self-congratulations were interrupted by the Deputy. He said that he had no doubt that the children in Kindergarten were doing well. He had seen that happen before, whenever anyone with a bee in their bonnet arrived. What he wanted to know, was: would it last? He predicted that their performance would start to flatten out in second class, and, by the time he got them in fifth class, they would be the same as any other kids he had taught at this school (Chall, 1983, comments on the particular difficulties of low SES[30] children at stages 2 and 3 of reading).

The meeting broke up shortly after that, in a subdued mood. I sensed that everyone else was wondering the same as me: could he be right?

LETTER 9—from Ambrose Hupnaught to Rosamunde Schuss

—in which Ambrose emphasises the importance of fluency.

3rd January

Dear Rosamunde,

What a great and unexpected pleasure it was to receive Paeredi's book on my illustrious name-sake! I did not know that it had been translated. It added enormously to my enjoyment of Christmas.

About your Deputy: indeed, he could be right; you don't need me to tell you that. You appear to have succeeded at one crucial stage of their acquisition of reading, but there are several more ahead of you before they can be said to be competent (but only competent) adult readers.

Word attack skills and instruction/management issues are proceeding nicely. You say that the children have a positive attitude to reading and to books. Fine. Two issues should now be occupying your mind, in preparation for the future: developing the fluency and the comprehension skills that will play an increasingly important part in their reading from second grade onwards.

Fluency first. This is an extremely important issue because it involves integrating all that they have been taught, and all their in-head knowledge, into one smooth, meaningful performance. Your main work on fluency will occur when they are in second class, but why not prepare now?

If there is a single point of agreement, among all the different theories, it is about developing fluency. Not only do all agree that it is desirable, but also, that it occurs through practice (although not all schools of thought would use that term). The differences appear when you consider how practice is to be achieved. Many writers (e.g. Chall, 1983) rely on the motivational aspect of stories themselves, and suggest that they be made available, together with supportive adults (c/f also, Hepler & Hickman, 1983). Others (e.g. White and Haring, 1976) recommend supervised reading sessions, and measuring the rate of oral reading each day. One can see a place for such stringent methods. It is possible that some

of your students will not find *any* book intrinsically motivating, in which case I suppose you make the decision for them, and say 'read it'. Extrinsic motivators[31] may be useful in extreme cases, like this. Another type of child may lack the courage and daring which Chall (1983) sees as necessary for breaking away from the 'glued to print' stage. As well as being the supportive adult (Chall 1983), you could also demonstrate to the children, in unequivocal terms, their rate of progress, by taking a one minute oral reading sample each day (White and Haring, 1976), but be sure that you control the difficulty of their reading material.

Another approach is to use a tape-recorder, so that they can read along with the story on tape (Chomsky, 1978). In this way, they can get the feeling of what it is like to read fast (I suppose it's like a pacer in a race) but watch for the child who is overusing the tape as a means of memorising the story. Chomsky let her children read the same story over and over again. Partly the necessity for this arose from letting them choose their own story—they chose stories that were really too hard for them. To me, it makes better sense to use the tape recorder as a way of assisting a child whose word-attack skills are approaching an automatic level but who still reads word by word, rather than in phrasal units. Hence, you should not have a big gap between his present reading skills and those demanded by the taped story.

LETTER 10—from Ambrose Hupnaught to Rosamunde Schuss

—in which Ambrose discusses an aspect of comprehension—the content of the passage.

4th February

Dear Rosamunde,

I have not written sooner because the Camberwell Campanologists were invited to tour the churches of the Western District. In all kinds of ways it was a splendid trip.

You want my thoughts on comprehension, and how to teach it. It is a complex area, in which factors interact with each other, and indeed, not all factors have necessarily yet been identified (Pearson, 1984a). On the other hand, can one wait until we have a good understanding of comprehension, and how to teach it? For whatever reason, this 'hands off' approach to teaching comprehension seems to have been the common practice but I find Pearson's arguments (Pearson, 1984a) against 'massive doses of unguided practice' compelling. Let us, therefore, look to what has been established, and do our best with that.

For teaching purposes, I like to divide the domain into content (pre-existing knowledge, semantics) and structure (syntax, arrangement of bits of information into paragraphs etc.) and metacognition (self-monitoring of one's reading, learning to learn strategies). I am going to limit myself to factual reading because it is important and unavoidable in one's life, unlike fiction, which, while important, is avoidable.

Semantic knowledge and background knowledge are intertwined. It appears that 'vocabulary knowledge is a crucial precondition to comprehension' (Pearson and Johnson, 1978) since words are, roughly speaking, the labels of concepts and 'without understanding the basic concepts in the text or question, one cannot make inferential links' (Trabasso, 1981), or even gain access to the meaning. Lapp and Flood (1984) have a passage on Rigging the Mainsail[32] which illustrates this point well. Furthermore, it appears that there are degrees or stages in knowing the meaning of a word. Jenkins, Pany and Schreck (reported in Beck, Perfetti and McKeown (1982) found that subjects could pass a multiple choice vocabulary test, but did not improve on comprehension scores on passages using the

words. Their findings suggest that, although subjects could recognise word meanings, they could not do so fast enough, or automatically enough, for comprehension of the passage. Other studies have shown that less skilled comprehenders may be as accurate as skilled comprehenders on semantic decisions, but they are slower. Beck et al, (1982) suggest, then, a continuum:

- automatic accession of some word meanings
- accession with some effort or attention
- meaning not available to the reader.

I think that these findings are important: they help to explain why routine dictionary work has not succeeded, in many cases, in improving vocabulary or comprehension. Further, they suggest that we should be focussing on production, rather than recognition, in our teaching and testing of vocabulary knowledge. Beck et al. (1982) did evolve a method for teaching vocabulary, which fulfils these requirements, and which led to more effective comprehension and more frequent usage of those words. I am enclosing a photostat of their article. Notice, in particular, that the words were grouped around a common topic. This strikes me as a particularly sensible approach, in that the core and the boundaries of a particular word's meaning are sharpened by comparison with related, but different, words (and concepts). Another effective feature of their method was the system of review, concurring with what we know about the contribution made to learning by cumulative review.

One way in which you can incorporate the review of words previously learnt is by developing a system for reviewing words in a passage, before that passage is read. As well, written experiences can be planned and linked to the vocabulary work in various ways which you, with your practical approach, can devise far better than I can.

Perfetti et al's (1982) method of teaching related sets of words has similarities with the way that vocabulary can be taught in subject-areas. Queensland's own, Morris and Stewart-Dore (1984) have developed a sensible, and highly practical, method of preteaching the vocabulary of a topic. Their book is available now, so you can read it for yourself. Although it is addressed to high school teachers, I think you could adapt their methods, particularly for those ubiquitous projects. Why not make them a *real* learning experience?

It seems to me that in systematically preteaching key terms, within a topic area, we are also furnishing the children with a knowledge framework, into which they can incorporate the material they encounter in the print. Here, I think, we are moving towards an explanation for the high correlation between vocabulary knowledge and success in comprehension: it is not just that knowing the meaning of the words gives access to the meaning in the print, it is also that knowing the meaning of the words is an indication of an existing schema, or mental framework, because of the bond between words and concepts. A high vocabulary knowledge suggests a rich conceptual schema which facilitates the comprehension of new material. You can now see why I strongly favour an approach such as that outlined above, rather than vocabulary work based on a set of words chosen at random, or arbitrarily.

When you are talking to your teachers, about vocabulary, and its importance in comprehension, you might expose them to Rigging the Mainsail (Lapp and Flood, 1984) and point out that their non-comprehension of the passage, and of the words, is an indication of their poorly developed schema about sailing. They will probably get the point: in teaching a topic area, where print sources will be used, they need to identify key terms, and teach them before the kids start reading. In doing so, they will also be providing their children with a mental framework.

A further advantage of this approach, as Morris and Stewart-Dore (1984) point out, is that teachers become aware of the vocabulary loading in various sources of information. They should then make a better match between child skills and reading material, rather than simply letting the children loose in the library.

LETTER 11—from Ambrose Hupnaught to Rosamunde Schuss

—in which Ambrose grapples with syntax and structure.

20th February

Dear Rosamunde,

First, a clarificatory note to my last letter. Adequate background knowledge is, of course, more than knowing the meaning of the words, and the issue becomes more complex as the child moves towards high school. However, let us leave this issue until later, and surge ahead with our third and fourth graders. One other point—a related issue is activating background knowledge, about which I have said nothing; but I seem to remember your doing an essay on advance organisers[33], and pre—and post-questioning in comprehension, so you will have no problems there.

Now, syntax. Syntax, both of sentences and paragraphs, will need your attention. Your children know the basic forms of syntax, and demonstrate this knowledge in their speech and writing. However, the syntax of connected discourse needs specific treatment. Readibility formulas which include sentence length pay some heed to a syntactic factor, I suppose, in that longer sentences are more likely to be compound or complex, and hence have more intricate syntax. Hence, stories whose content is very suitable for upper primary (e.g. The Secret Garden) are inaccessible to most children because of their syntax. Consider, for instance:

> As she listened to the sobbing screams she did not wonder that people were so frightened that they gave him his own way in everything rather than hear them. (The Secret Garden).

Even competent primary readers are thrown by *that* after *wonder*, and the that . . . so . . . that construction, complicated even further by the negative before *wonder*.

On the other hand, the simplest form of sentence syntax—a simple, single clause sentence, can also interfere with the processing of meaning. Consider this paragraph:

> Their legs are black. Their shoulders are black. Their ears are black and the fur around their black eyes is black, too. Everywhere else their fur is white. Pandas have white faces and white middles and short white tails. (Gross, A Book about Pandas).

Children, and I, myself, find it difficult to extract the colour patterning of a panda from that monotonous paragraph, and I think that the reason is that the information is not structured for us. Pandas are basically white animals, with black bits. The colour proportions are not reflected in the language, because the writer has chosen to write simple sentences without the connectives which make explicit the relations among bits of information (Pearson, 1976).

Pearson argues that longer sentences (e.g. Because the chain broke, the machine stopped) may be more easily understood because the relationship between events is made explicit, whereas reducing the sentence length (The chain broke. The machine stopped.) places an 'inferential burden' on the reader (Pearson, 1976, p.110). He suggests that correlations between sentence length and comprehension difficulty can be partly explained by the fact that longer sentences are communicating more complex relations.

Pearson's experiments serve to warn us against reducing our style to atomistic bits. However, certain syntactic forms are difficult, and here you must make a decision:

1. are you going to teach them explicitly, i.e. bring the reader to the level demanded by certain prose forms;
2. or are you going to monitor the material presented to your children, and exclude more complex forms, or explain them orally?

Personally, I favour the first, but it is only an opinion, based on another opinion—that what you get is what you teach, and if you don't teach it, you can't expect it. It seems to me that syntactic forms should be a component of written and spoken programs from the third grade on and even earlier, in an informal way, as the need occurs. Such a program provides the child with a means of reading about, and expressing, increasingly complex relations between propositions. Some evidence for this approach comes from research into sentence amalgamation exercises, and their effect on comprehension (Pearson and Camperell, 1981).

Unfortunately, I can write little more than the above, on the role of syntax in comprehension. What syntactic forms should be explicitly taught, how they should be taught, whether there is a hierarchy of simple to complex forms, the transfer of syntactic knowledge from reading to speech and writing, and vice versa, or even from the instructional set to other print and writing, are all questions awaiting an answer.

LETTER 12—from Rosamunde Schuss to Ambrose Hupnaught

in which Rosamunde asks how to teach the whole comprehension package.

4th June

Dear Ambrose,

I have found your comments on content and structure to be useful. They gave me a basis for preparing a sequenced set of instructional materials, both for reading and writing purposes. I am trying them out on those fourth and fifth grade children whose reading age is suitable. However, there is still one big issue that worries me: whenever a domain is partitioned, for instructional purposes, then at some stage the child has to incorporate the skill previously practised in isolation, into the total task. If there are only one or two components, the chances of successful incorporation are quite good, I have found, and failure is relatively easy to overcome. But when there are many components, and the task itself is not static (as in the case in comprehension—you do not comprehend the same, or even similar passages over and over again), the chances of the poor comprehender incorporating *all* the skills successfully, including those learnt some months previously, are not good. From what I remember of the research, those experimenters who used this approach isolated only one factor in comprehension, and tested the effect of separate instruction on that one factor. They got their results, but they have not really addressed the issue I am talking about here.

LETTER 13—from Ambrose Hupnaught to Rosamunde Schuss

—in which Ambrose discusses metacognition.

22nd June

Dear Rosamunde,

The main problem with corresponding with one's former students, who are now teaching, is that they will raise difficult real-life problems, for which there are no solutions yet. The news

is not totally bleak, however—there have been some recent reports which suggest, if not clearly indicate, possible approaches. It seems to me that you are talking about the degree of the child's active engagement of those strategies he possesses which are relevant to the task before him—which involves all kinds of discrimination, selection and application processes, all of which must be done by the child himself.

This issue has been addressed in two articles, recently, both of which I am enclosing. Paris et al, (1984), in fact, echo your point (if I have understood if correctly) in their comment that declarative knowledge (knowing that ... e.g. knowing that making a summary can aid recall) and procedural knowledge (knowing how... e.g. knowing how to summarise) do not guarantee that the child will apply these strategies appropriately. This latter kind of knowledge—knowing when and how to use various strategies for various purposes—is referred to as conditional knowledge. Paris et al. attempted to teach all three types of knowledge. As well, they taught their subjects to 'evaluate, plan and regulate their own comprehension in strategic ways' (p.1241). They attacked a difficult, but important area, and in so doing, have provided suggestive leads for classroom practice.

They themselves failed to gain significant results on the standardised reading tests, and from the tone of their lengthy discussion, it can be inferred that they were disappointed. They should not have been, for two reasons, at least.

1. The children's actual instruction time with Lipson (p.1243) may have been as little as fourteen hours. Although the authors disseminated their methods to classroom teachers, there is no guarantee that those teachers attempted to implement their methods, nor was there any reported measure of teacher implementation. During these fourteen hours. Lipson presented 'a rich variety of comprehension strategies ... understanding the purposes of reading, activating relevant background knowledge, allocating attention to main ideas, critical evaluation, monitoring comprehension, and drawing inferences ... plus others' (p.1242). As well they attempted to 'convince children that the strategies are important, useful and necessary' (p.1242). The authors attempted an enormous task in very little time, in intact whole class situations. (Some children would already be performing at the top of the measuring instrument, and hence had little room to improve. Others, at the bottom end, may well have been hindered from applying the strategies because of inadequate word identification skills—an uncontrolled factor in whole class treatment). One would need an enormously powerful instructional, and management package to change comprehension scores on a standardised instrument after 14 hours of instruction.
2. The authors themselves, are now questioning the point of using standardised achievement tests for measuring the effectiveness of a treatment—that I see as a fortunate outcome of their study. But then, I know that you, too, are convinced of the value of curriculum-based assessments, both for teacher and for pupil, so I won't comment further—except perhaps, to point out that had Paris et al decided, from the beginning to use a testing instrument based on their teaching objective, they may have focused more closely on their main interest—as indicated by their question sheet—i.e. increasing awareness and use of effective reading strategies already possessed by the child, rather than trying to teach an enormous range of comprehension strategies as well, perhaps in the hope of affecting the reading achievement score.

LETTER 14—from Rosamunde Schuss to Ambrose Hupnaught

—in which Rosamunde agrees with Ambrose.

26th June

Dear Ambrose,

Thank you for the article by Paris et al. (1984), and for your comments. Fortunately, we have longer than 14 hours, and so I shall be able to develop a program around their approach

with additional input, to ensure that my 'at-risk' children are progressing, rather than using a post-measure only. You stated that you would send two articles, but in fact sent only one.

The Deputy wants me to send for the materials which Paris is prepared to supply (see Paris *et al*, 1984). I think we are making progress, there.

LETTER 15—from Ambrose Hupnaught to Rosamunde Schuss

—in which Ambrose continues on metacognition, and brings the correspondence to an end.

2nd July

Dear Rosamunde,

The other article is from a book edited by Flood (1984). The approach of the authors (Bransford, Vye & Stein, 1984) is more circumscribed than that of Paris et al. (1984), in that it focuses on teaching children to evaluate the material they are reading, and to activate strategies for understanding and remembering the content. In particular, it presents children with two types of material: a (relatively) arbitrary collection of facts, and a collection of facts which can be related to an explicitly stated principle(s), such as function(s).

The main teaching tasks are:

1) to show children how much harder it is to understand, and remember, arbitrary facts, and
2) to show them ways of organising the material according to the principles, either when the principles are explicit, or when they are implicit.

Their approach is based on the different ways that good and poor comprehenders prepare themselves for answering questions based on memory and understanding, after reading a passage. Good comprehenders actively search for an organisational principle; poor comprehenders passively read the passage again, then think that they are ready. Bransford et al. are canny: they have nicely delineated a portion of an important area, demonstrated effective methods, and explicitly sounded cautious warnings against assuming that their subjects can then transfer the skills trained to harder, more complex material. In the meantime, they are working on ways to facilitate this transfer. I await their further work with interest. In the meantime, you may find their approach suggestive.

I am also enclosing an article by a person with the fascinating name of Taffy Raphael (Raphael, 1984). You may find it profitable to follow up his body of research. He has investigated the issue of teaching students to discriminate different types of comprehension questions (e.g. text explicit and text implicit) and to use different types of strategies in answering them. He also devised and tested *aide-memoires* which appear to be effective.

It is with a touch of sadness, Rosamunde, that I write that this will be my last letter—but only a touch, because my joy is unbounded. The Australian Conference of Campanologists, with which the Camberwell Campanologists are affiliated, has planned a tour of the churches of the Po Valley, and they have asked me to lead it. I immediately put in for leave, and was refused, so I resigned my post here, and intend to spend all my time with my beloved bells. Some churches in Europe actually *pay* their bell-ringers.

(1) MA mental age
RA reading age

(2) ***Withdrawal system:*** taking the pupils out of their regular class for specialized teaching

(3) Stanine: Contraction of 'standard nine'; a scale developed by the U.S. Air Force during World War II to provide a single-digit system of scores, running from 1 to 9, with a mean of 5 and a standard deviation of approximately 2 (Anastasi, 1976).
Thorley (1976) reported that in a Western Sydney suburban school in April, 1975, 30% of the children in each of the grades 1-6 were 'below the 10th percentile on State norms (x = 35%, range = 31-45% below 10 percentile' (p.28).

(4) ***Executive support:*** help provided to a teacher by the school principal, the deputy principal and other staff with administrative responsibilities.

(5) ***Spache and Spache (1977):*** they cite a number of reasons why choral or oral reading, particularly of basal readers in group situations, is overused in many classrooms. Their criticisms centre on the fact that following a poorer reader produces more errors, poorer phrasing and interferes with the development of efficient eye movements and fixations (Luther, 1953).

(6) According to Dolch, the 220 words in his list constitute more than fifty percent of the words in easy reading materials. (Dolch, 1936).

(7) *D.E.A.R.* (Drop everything and read) scheme: a reading program based on the encouragement of reading for pleasure, aimed particularly at motivating poor readers.

(8) *D.S.P.:* the Disadvantaged School Program—operated by the Commonwealth Schools Commission, provides additional funds to schools that serve communities with the greatest degree and concentration of socio-economic disadvantage.

(9) Samuels (1981) and Hoffman and Rutherford's (1984) analysis of schools with successful reading programs indicated that one important factor was the commitment of the school and district executives to the reading program.

(10) ***The zero-exclusion model*** proposes that once a child enrols in a regular school, it should be almost impossible to remove the child from that program for any reason.

(11) According to Thorley (1976), some of the features of a teaching program that incorporates minimal performance standards include the following:
   a. all children who are failing to master those minimal objective standards (both terminal and intermediate) appropriate to their grade level are given access to exceptional teaching/special services.
   b. instructional decisions are adjustable from day-to-day on the basis of progress sampling of performance on the minimal objectives. Inadequate rates of progress alert the teacher to the need for change.
   c. minimal objectives are literally just that. They are minimal performance standards that each and every child shall learn. Few, if any, will learn the bare minimum. Indeed, some will even demonstrate mastery of the year's objectives in the first week and will proceed immediately to developmental goals in that subject area.
   d. the components of exceptional teaching should be limited at this point in time to the minimal essential objectives in language, mathematical and social skills. It is not desirable to apply—nor do we have any experience of the consequences of applying—these techniques outside those areas.
   e. many detailed sequenced sets of minimal objectives are now being developed, and can serve as guidelines for schools. However, our own experience suggests that few people are satisfied with someone else's set. In fact, to revise or refine a set to suit one's own particular needs leads to a better understanding of the importance of easy-to-hard sequences in eliminating school failure on complex tasks, and to a better understanding of the rationale for systematic instruction. In short, completion of this task established the teacher's readiness for using the objectives, and their commitment to achieving them. (p.31)

(12) ***Mastery learning:*** If the students are normally distributed with respect to aptitude for a subject (e.g. mathematics, science or history) and all the students are provided with exactly the same instruction in terms of amount and quality of instruction and time available for learning, the end result will be a normal distribution on an appropriate measure of achievement. Conversely, if the students are normally distributed with respect to aptitude, but the kind and quality of instruction and the amount of time available for learning are made appropriate to the characteristics and needs of *each* student then the majority of students may be expected to achieve mastery of the subject. (Bloom, Hastings & Medaus, 1971).

(13) ***Structured approach:*** in which the material to be learned is organized around an hierarchically-organized set of component tasks, each of which must be mastered sequentially.

(14) ***To decode:*** learning to associate an arbitrary set of written symbols with corresponding parts of spoken words (e.g. a = 'a').

(15) ***Phonic skills:*** those skills required to associate arbitrary written symbols with the corresponding parts of spoken words. Phonic rules govern the sound-symbol associations.

(16) ***Phonics:*** sound-symbol relationships.

(17) Chall's Stages:

0 Pre-reading: birth to age 6

1. Initial reading or decoding stage: Grades 1-2, Ages 6-7
2. Confirmation, fluency, ungluing from print: Grades 2-3, Ages 7-8
3. Reading for learning the new: A first step
4. Construction and reconstruction—a world view: College, Age 18 and above (Chall, 1983)

(18) ***Phonetically regular words:*** these range from those requiring simple sound-symbol correspondence skills (e.g. 'on' = o-n) to rule-governed words such as silent 'e' marker words (e.g. 'ate') and rules for selecting between certain vowel pairs (e.g. 'a' medially. 'ay' finally).
Irregular words: here spelling does not follow any accepted phonetic rule (e.g. 'was'. 'walk').

(19) ***Generalization:*** using material or skills learned in one situation in other contexts (e.g. using a phonic rule learned at school to decode a word written on the back of a bus).

(20) ***Meaningful words:*** those that have special significance for each child, in terms of his or her particular experiences and home background.

(21) ***Engaged time:*** the period during which the student is actively involved in the task to be mastered.

(22) ***Grouping:*** organizing small numbers of children, in terms of some characteristic (e.g. similar level of achievement on a particular subject level) for a specific purpose (e.g. reading).

(23) ***Direct instruction:*** deliberate and explicit teaching and testing of those skills considered to be essential for mastery in a subject area.

(24) ***Formative testing:*** assessment that is on-going during a teaching program which contributes to modification and development of that program. In contrast, summative assessment is carried out at the end of a teaching program, as a final evaluation of the program's efficacy.

(25) Share, Jorm, McLean & Matthews (1984) investigated sources of individual differences in reading in the Geelong region in a longitudinal study of 543 children. A variety of individual attributes covering prereading abilities, oral language abilities, motor skills, personality, and home background were measured at school entry. Reading achievement was subsequently assessed at the end of Kindergarten and Grade 1. The

strongest predictors of reading achievement were tasks tapping phonological processing skills, interdigital dexterity, and familiarity with the alphabetic code of English script. Collectively, individual attributes accounted for 63% of the variance in reading achievement at the end of Kindergarten and 59% at the end of Grade 1. A short set of five predictors offering a potentially useful screening test for the early identification of reading-disabled children was identified. This included:
Phoneme segmentation. This test required the child to break a word into its constituent phonemes.
Letter names. Children were asked to give the names of nine letters.
Letter copying. Letter form and orientation were scored separately for six lower case letters (a, c, k, h, e, b).
Sentence memory. The child was required to repeat a spoken sentence. There were two versions of this task—rhyming and non-rhyming—each involving 12 sentences.
Sex. This appeared to have been operating as a moderator variable (Anastasi, 1976), indicating differential predictability for boys and girls.

(26) In the last few years there has been a steadily increasing body of research which demonstrates the important role played by phonological awareness (also called phonemic awareness) in reading acquisition. Correlational studies (Share, Jorm, Maclean & Matthews, 1984), predictive studies (Jorm, Share, Maclean & Matthews, 1984), and causal studies (Bradley & Bryant, 1983) have all suggested a strong relationship, using a variety of tasks to measure phonological skills. See also Bradley & Bryant, 1978, 1985; Juel, Griffith & Gough, 1986; Liberman & Shankweiler, 1985; and Tunmer & Nesdale, 1985. Although the strength and direction of the relationship have been established the issue of how best to teach phonological skills has not yet been addressed.

(27) ***Sightwords:*** words that are presented as visual units. No reference is made to letter/sound correspondence in teaching these words. Rosamunde is using this approach for the first 40 words taught, when her main aim is to convey that print has meaning. She also uses this method for irregular words.

(28) ***Basal reader.*** A co-ordinated series of reading books which use the controlled introduction and repetition of words to help the child engage in meaningful reading. In some series, once the 'basal' reader has been mastered, the child will immediately be able to read one or more other books at the same level, because most of their vocabulary is already known.

(29) ***Standardized scores:*** these are derived from administration of standardized or norm-referenced tests, by which a child's score on a test (e.g. on a test of achievement or intelligence) can be compared with the scores of other children of the same age on the same test. These may be compared with scores obtained on a criterion-referenced test, where a child's performance is compared with a predetermined criterion or mastery level.

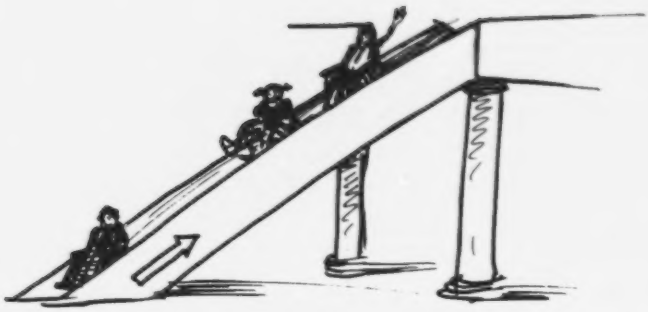
(30) ***SES:*** Socio-economic status; i.e. environmentally disadvantaged.

(31) ***Extrinsic motivators,*** e.g. stars, stamps, free time, treats

(32) 'Bend to boom and attach outhaul. Secure tack to gooseneck and attach main halyard. Hoist mainsail while making sure battens are in their pockets. Sail will not go to the masthead if vang, mainsheet or outhaul are not loose.' (Lapp & Flood, 1984).

(33) Advance Organisers (Ausubel, 1968) are used 'to bridge the gap between what the reader already knows and what the reader needs to know before he can meaningfully learn the task at hand' (p148). Although there have been many investigations into the effectiveness of advance organisers, researchers have not yet reached a consensus on an operational definition (Tierney & Cunningham, 1984). Many teachers regard structured overview (e.g. in social science classes) and story previews as types of advance organisers.

Chapter 17



HANDICAPPED YOUTH IN TRANSITION

Trevor R. Parmenter

In building bridges from school to working life for young people with disabilities there are at least three principles upon which the plans or strategies ought to be based. These three principles are examined in the first part of this chapter. The role of education in the transition process for disabled adolescents is then considered and some transition program strategies are proposed. Finally, some conclusions are drawn about the provision of quality transition programs in Australian schools for students who have disabilities.

UNDERLYING PHILOSOPHIES AND PRINCIPLES

1) *Normalization*

In his most recent formulation of the principle. Nirje (1985,p.67) suggests:

> The normalization principle means making available to all persons with disabilities or other handicaps, patterns of life and conditions of everyday living which are as close as possible to or indeed the ***same as*** the regular circumstances and ways of life of society.

Nirje makes explicit the need for the person with disabilities to experience the normal rhythms of the life cycle and patterns of culture in any given environment. He also stresses their need for normal respect, as well as economic and environmental standards within a heterosexual world.

The components of the normalization principle identified by Nirje provide a firm basis for the practice of integration. However, happily, Nirje proceeds beyond the mere physical dimensions of integration, for he stresses its intrinsic meaning; the fact that integration allows one 'to be yourself among others—to be allowed and to be able to be yourself among others' (personal communication). One aspect of this process is the development of personal integration which, Nirje suggests, 'is related to the developing and changing needs for personal ir teraction with significant persons' (Nirje, 1980, p.48). For instance, if a person with a disability is unable or prevented from moving from his/her parental home, there is a subsequent loss of the opportunity for obtaining a significant level of personal integration, just as there would be if marriage were also prevented.

In the context of the transition process it is important to appreciate that one of the most important outcomes of the normalization principle is the participation of a person with a dis-

ability in his/her culture. Above, all the central feature of the principle is normal respect for the integrity of the individual. Nirje neatly operationalizes the concept:

> . . . the normalization principle means that you are right when you let the handicapped person obtain the same or as close as possible to the same conditions of life as you would prefer if you were in his situation (1985, p.67).

This principle, therefore, has profound implications for the way we set goals and design educational, vocational and community programs for young adults with disabilities.

2) *Independent living*

In an earlier monograph Parmenter (1980) describes the principle of independent living as follows:

> 'Independent Living' has emerged as possibly the most dynamic development in the area of the disabled since the popularization of the normalization principle . . . in its most recent form the independent living movement is seen as 'an emerging social movement' (De Jong, 1978) or as 'a civil rights movement' (Roberts, 1977), being firmly based in the ideological commitment society has towards consumer sovereignty, self-reliance and political and economic rights (p.43).

Further, Stoddard's (1978) summary of the dimensions of independent living is also relevant:

> When those active in the disabled movement use the term 'independent living' they are referring to their ability to participate in society—to work, have a home, raise a family, and generally share in the joys and responsibilities of community life. 'Independent living' means freedom from isolation or from the institution; it means the ability to choose where to live and how; it means the person's ability to carry out activities of daily living that non-disabled people often take for granted (p.2).

Thus the concept extends far beyond the provision of aids for daily living—its most potent aspects are its psychological dimensions such as the scope which a person with disabilities has for making his/her own decisions. It is suggested that one of the most important goals of the transition process is to equip the young disabled person with the skills of making informed decisions. However, as De Jong (1981) points out, the barriers to the achievement of independent living often reside more in the environment than in the person with a disability.

3) *Self-determination*

Together with the physical and psychological dimensions of independent living, the right to self-determination is one of the key features of adult status. In a working paper prepared for the Organization for Economic Cooperation and Development's (OECD) Centre for Educational Research and Innovation (CERI) study of the education of the handicapped adolescent, Ms Anne Benard suggests that becoming an adult requires:

- leaving the protective environment of childhood
- accepting one's limitations and believing in one's potential
- discovering the world of work, economic, technological and social realities
- discovering the scepticism and lack of information given by employers and colleagues
- developing personal independence and enriching and fulfilling oneself in contact with others.

She suggests further that occupational integration is one of the most important aspects of social integration. Working gives one financial independence, awareness of one's value to society, self-enhancement and fulfillment, and creates a network of relationships. But these are not easy goals to achieve, even for young people without a disability. Nirje (1972) notes,

> To assert oneself with one's family, friends, neighbours, co-workers, other people, or *vis-a-vis* an agency is difficult for many persons. It is especially difficult for someone who has a disability . . . But in the end, even the impaired person has to manage as a distinct person, and thus has his identity defined to himself and to others. . . Thus, the road to self-determination is indeed both difficult and all-important for a person who is impaired (p.177).

Of course, simply providing the structures within which independent decisions may be made is not enough. A central focus of all education and training programs should be upon those personal, social and communication skills which will enhance the competence of young persons with a disability to assert themselves appropriately and coherently.

THE ROLE OF EDUCATION IN THE TRANSITION PROCESS

Educational systems have rarely come to grips with the specific structural, instructional and curriculum needs of disabled students, particularly the adolescents and young adults. Structurally the solution is often an extension of the segregated special school or special class facility provided for younger children. Too often they remain in the ***same*** facility as the younger disabled pupils. However, the concept of the ***criterion of ultimate functioning*** (Brown, Nietupski & Hamre-Nietupski, 1977), with its focus on the need for special education programs to be more community-referenced, has had an impact upon the way special education programs are being delivered. Increasingly schools are planning and carrying their programs out in community settings.

Despite a considerable body of research evidence and large numbers of exemplary projects demonstrating the effectiveness of a variety of instructional and pedagogical techniques, personnel employed to teach students with various learning disabilities are relatively slow to adopt new techniques or to question the appropriateness of the techniques they are using. While individual educational programs are either mandatory or highly recommended, the bottom line is the degree of effectiveness of the instructional techniques in producing desirable educational outcomes.

The 'eternal child' syndrome has had a profound effect upon the way curriculum has been designed for the older student with disabilities. As the traditional special education perspective has not been future-oriented, teachers have generally based their instructional objectives upon the students' performance on a range of assessment and diagnostic tests. They have not related that performance to the need to adapt to future settings and future needs. Consequently, Rusch and Mithaug (1985) suggest that handicapped students have tended to see themselves for ever as service recipients rather than service providers. For instance, they point out,

> The role expectations of such persons become embodied in a host of dependent behaviours, most of which involve the receiving of assistance frequently, if not continuously, from those primarily in the roles of teacher, parent, physical therapist, occupational therapist, speech pathologist, nurse, and psychologist . . . Teachers, parents and others expect the . . . handicapped student to be dependent—that is, acted upon by others rather than *acting* upon on his or her own. Consequently, this student rarely acquires new roles . . . It is not surprising that these students seem more childlike than adultlike (p.179).

The problem usually commences within the infants and primary grades, as teachers try to

adapt the traditional academically oriented curriculum to meet the 'needs' of the handicapped student. A more contemporary approach to special education, suggest Rusch and Mithaug, recognizes the social settings or social systems in which individuals perform functions or roles in prescribed ways. For instance, the foundations of career education can be laid down in the early primary grades (Brolin & Kokaska, 1979). Above all, special education programs should be future-based and ecologically valid.

Transitional Program Strategies

1) *Acceptance of responsibility*

One of the most critical issues is that the school system must accept its responsibilities for contributing to the transitional stage of the lives of young people with disabilities. There needs to be an awareness of this responsibility at an early stage of the educational process so that the child with the disability, his/her parents and teachers are oriented to the future needs and desires of the child. This awareness will have direct effects upon the curriculum and subtle effects upon the psychological and social development of that child.

In many cases the responsibility of providing transitional programs in Australian schools has been left to special schools and classes. These have been developed in an *ad hoc* manner, often with little support or encouragement from central educational administrations. While there have been many innovative programs developed, there has been no coherent attack on the problem of segregation and no consistent evaluation of what is being practised in the special class.

2) *Problems in mainstreamed settings*

The greatest deficiency in regular schools is concerned with the mainstreaming of students with disabilities. In those regular schools where special classes have been established there is usually a high turnover in staff with a consequent lack of continuity of programming. Where the students with disabilities attend regular classes they are often disadvantaged, because their teachers are ill-prepared to meet their transitional educational needs. These schools often lack the physical resources to implement effective programs, and/or they lack skilled advisers who can help them redirect existing underutilized resources.

Programs in regular high schools that have a good record in meeting the transition needs of students with disabilities usually have the following characteristics:

i) an energetic, well-trained and well-informed teacher who takes responsibility for coordinating the program. This teacher is able to build a good rapport with other members of staff.
ii) a school principal committed to the program and providing moral and practical support to the coordinating teacher.
iii) a coordinator who is accepted as an executive member of staff.
iv) a coordinator able to foster community relationships—e.g. with other service organizations, employers and community groups.

An example of a highly regarded program is Daramalan College, a high school in the Australian Capital Territory (see Appendix).

Jean Reid, formerly in charge of Department of Special Education at Daramalan College, describes the organization of special education currently provided in secondary schools in Australia in the following terms:

Special classes have been the main organising strategy to cope with disabled students in secondary schools. These classes are often only operational in Years 7 and 8 and include not only the mildly mentally handicapped but often the cultural and socially disadvantaged, as well as those children with specific learning disabilities. Students in these classes are often disadvantaged because their segregated course of studies makes future integration difficult, and the teachers are often called upon to teach subjects beyond their competence. Many children become disillusioned and leave school at the minimum age, ill prepared to take their place in society (Reid, 1981).

According to Reid, an alternative curriculum should be designed to meet the needs of disabled students in secondary schools who do not wish to follow a traditional academic curriculum. Listed below are the full components of the vocational curriculum which she outlined:

(1) the infusing of career information into all subject areas.

(2) The provision of opportunities to develop as many work and leisure skills as possible.

(3) The development of literacy and numeracy skills necessary for everyday living.

(4) Work experience decision-making relevant to students' self awareness, interests and ability.

(5) Work experience—the interaction between school and the community, home and family—and choice of job or vocation.

With work experience as the nucleus, an alternative curriculum could be designed for disabled students. Such a curriculum should cover Years 7 to 10 and include the teaching of personal skills, social skills, basic skills, work and leisure skills. The core curriculum would consist of Apprenticeship Maths, English for Living (including remedial reading), Apprenticeship Science (basic requirements for entry into most apprenticeships) and Social Science for presenting knowledge of the community in which the students live. Personal and social skills could include strategies to develop initiative and independence to foster a greater degree of economic and emotional independence from the family, and to increase responsibility in interpersonal relationships and social groups. Work and leisure skill development would vary according to the resources and personnel of the schools but could include such subjects as technical drawing, woodwork, metalwork, motor maintenance, cooking, media studies, horticulture, photography, film making, pottery, jewellery making, screen printing, leatherwork, rug making. However, for a vocational curriculum such as that described by Reid to be implemented (and to be successful), appropriate teaching strategies and organisational structures would need to be designed. Some examples that could be implemented are described below:

Teaching Strategies

The following list of strategies is only intended as a guideline. Many teachers and schools could provide a more exhaustive and pertinent list.

(1) A careful analysis of the complex educational needs of each individual student in the unit; such an analysis should include not only the student's weaknesses but also the strengths.

(2) The provision of a caring and sharing environment based on personal relationships and personal responsibility. Such an environment frees students from anxiety and fear of failure, enabling them to explore their own potential and set their own goals.

(3) Individualised instruction as far as is practicable. The involvement of parents as active partners in education, for instance, as tutors in reading and mathematics, allows for more individual programs to be designed.

(4) Intensive use of visual media as an alternative teaching tool, so compensating for those with a severe reading disability.

(5) An increasing use of modern technology for basic drill and remediation (computers, calculators, spelling machines).

Organisational Structure

The following organisational model may be defined as 'a school within a school'—a special educational unit offering a complete educational program within a regular school.

(1) The setting up of a Department of Special Education responsible for all students in all subjects within the unit.
(2) The use of special education teachers to teach Mathematics and English, as well as being responsible for pastoral care, counselling and the development of personal skills.
(3) Specialist teachers from the regular school to teach specialist subjects; such teachers to be given in-service training within such areas as teaching techniques and classroom control and organisation of disabled students.
(4) Students in vocational classes to be integrated in many of the social, sporting and workshop activities, in the school, but segregated for the core curriculum.
(5) Vocational classes to be 'open-ended' so that students may move easily from or into classes as their needs dictate.
(6) Core subjects to be timetabled for morning periods as far as possible.
(7) Frequent evaluation of the program, assessing the extent to which it meets the needs of the students.

3) *Curriculum development*

Insufficient attention has been given by educational systems to the development of adequate curricula. All too often the older child with learning problems is forced to follow curricula designed for students who are preparing for an academic career. For the student with disabilities that result from intellectual impairments, the curricula should be functionally based, reflecting the skills that are required for effective community adjustment. Research indicates that there should be an emphasis upon communication, social and interpersonal skills.

With more effective service delivery policies, curriculum development can proceed on a mutual basis across a number of schools or educational regions. There are a significant number of well-researched curriculum models and materials available for this stage (e.g. Brolin, 1982; Wilcox & Bellamy, 1982), but schools are often slow to adopt them. One of the reasons is the inadequate level of in-service training available for teachers who work in this area. In Australia there has been a significant reduction in the amount spent on training of personal development, despite a philosophical commitment to initiatives such as integration and education for those with severe disabilities. Consequently, this has placed enormous strains upon schools and teachers.

4) *Delivery of programs*

Programs designed to facilitate community adjustment are at times best carried out in community settings. This is being increasingly recognized by special and regular schools. However, there is not a universal acceptance of this principle as some teachers and administrators view off-school programs with some scepticism, feeling that 'real' education must take place in classrooms. Nevertheless, there needs to be a rational approach to the delivery of programs, based upon a clear understanding of the principles of learning. Many skills require systematic training. For instance, Close, Sowers, Halpern & Bourbeau (1985) point out,

> Classroom instruction provides teachers with the opportunity to present rules and examples clearly, to provide students with practice on the response chains associated with each rule, and to offer students corrective feedback. The provision of such instruction in the community is often limited by staff and resource constraints and by the uncontrolled vocabulary that accompanies real-world settings (p.169).

This does not deny the need, however, for programs to be practised in community settings once acquisition of the skills has been accomplished. Teachers often do not recognize that many students with disabilities do not learn complex independent living skills by simply being exposed to situations. This is also one of the dangers of unstructured work experience or work study programs.

5) *Development of individual transition plans*

Many problems inherent in this stage of the transition process can be lessened by adequate planning for each student. Individual transition plans, drawn up in the early secondary school years, can assist in the provision of effective programs to meet current and future needs of the student. Obviously these would need to be regularly reviewed so that strategies can be modified. Overall goals may also need to be modified so that students are not tracked into inappropriate programs. Prediction of ultimate outcomes for these students is a particularly hazardous exercise. Such plans need to involve the student, the parents and the various personnel who are responsible for programs, including people outside the school system who may be involved in later stages of the transition process.

In summary, the following strategies are recommended:

i) Education systems should develop policies which explicitly state how the system will assist young disabled people to make the transition from school to work and adult life.

ii) Secondary schools should be provided with sufficient resources, including specially trained teachers, to meet the transitional needs of students with disabilities.

iii) Curriculum units should be established to help schools translate research programs into practice. Teams of resource personnel who are involved in action-based research programs should be employed to assist in this process.

iv) Senior secondary school programs should be community references, both in the sense of ***what is*** taught and ***where*** it is taught.

v) Individual transition plans should be established for each student. These must be regularly reviewed and programs adjusted as indicated. The plans should be drawn up by school staff and personnel from those services to which the student may proceed after schooling.

CONCLUSIONS

The current emphasis upon quality transition programs is obviously a reflection of the awareness of an urgent social need, not only for youth who are handicapped by a disability, but for youth generally. In a sense, it is almost too late for the current generation of adolescents, as the solution to the problem rests largely with educational and other service systems, such as health and community welfare agencies, at a much younger stage of their lives. Career education in its broadest sense must start early and for many young people with disabilities, their primary and junior secondary education has not equipped them for benefiting from the later stages of the transition process.

While service organizations consider that the development of a young person's skills and knowledge is the prerogative of education authorities, an earlier start to inter-agency consultation and coordination must be made for all young people with disabilities. It is here that the suggested long-range individual transition plan has relevance. This could be a vehicle through which the various sectors make a concrete commitment to their involvement in the transition process, leading to a more effective planning and utilization of resources. A cardinal factor is the involvement of parents in this planning. Parents often receive little information or guidance concerning their child's future life choices or, even worse, the information they do receive is often inappropriate. Parents require sympathetic assistance in the life-long process of coming to grips with the fact that they have a child with a disability—a child, however, who has the same rights and privileges of a nondisabled person.

Active participation of the consumer in planning for his/her career choices is also mandatory to counter feelings of rejection so that acceptance of the negative assessments of those around them is gradually achieved. A combination of patronizing attitudes on the part of parents, teachers and nondisabled peers so often limits the horizons of the disabled person.

Although integration programs have been in existence for a number of years, a critical examination needs to be made of their success, particularly in regards to their relevance for adolescents. This is not to deny the philosophical correctness of integration, but it is meant to question whether the implementation has been effective. Segregated programs were a result of the regular system's perceived inability to cope with children with disabilities. One wonders if anything has really changed!

This leads to a questioning of the curriculum, instructional strategies and personnel preparation. The transition curriculum must recognize that it is impossible to separate personal and social needs from a capacity for work. While work does provide a social framework around which a person can achieve a reasonable sense of personal satisfaction, too frequently the low status jobs gained by people with disabilities—even those in competitive employment—do not guarantee wide social acceptance or satisfactory community adjustment. Therefore training in interpersonal and social skills is as important as how to get and keep a job. And as many young people with disabilities will either choose not to work or will not be able to obtain work, the curriculum also must provide them with the skills to help them occupy their time in a meaningful and satisfactory way.

There is little evidence, at least in the Australian scene, that personnel, including teachers, are being adequately prepared to deliver transition programs. What is even more disturbing is that personnel preparation does not seem to be a high priority area in government planning. Effective training programs would allow professionals to study and challenge the various models and philosophies of the transition process; they would give them skills to assist young people through the process; and above all they should provide them with the commitment to an ongoing evaluation of the profession they are practising.

Finally, there is a need for a greater social commitment to research which is directly related to the social and vocational integration of young people in the transition process. In comparison with the amount spent on service programs in many countries, whatever its inadequacy, only a miniscule proportion of that sum is spent on research and evaluation. Without an adequate data base we cannot even appreciate the extent of the problem. Without program evaluation we cannot be sure what we are doing is useful. And above all, if we do not listen to what these young people are trying to tell us, we may be limiting their choices to contribute to the community so that they become in Patricia Rowan's (1985) words, 'passive recipients of society's institutionalized charity' (p.12).

SOME EXAMPLES OF TRANSITION PROGRAMS

Following are brief descriptions of a small sample of innovative transition programs which have been set up in Australia. These programs are not fully representative of what is currently happening in this area, but they do indicate that there is an awareness of the transition needs of young people with disabilities. Some of the programs are initiatives of government agencies, but the majority were started as a result of grass roots action. It is particularly encouraging that there is a growing number of energetic, highly professional personnel who are committed to providing high quality programs. The challenge ahead is for the work to be disseminated and replicated.

Appendix 1 Mater Dei Special School Community Residential Program.

Appendix 2 The T.R.A.I.L.S. Centre

Appendix 3 Work Preparation Programs

Appendix 4 IMAC Service: A Pilot Project

Appendix 5 The G.J. Coles Venture

Appendix 6 The Epilepsy Association of South Australia's Training and Placement Service

Appendix 7 Active Job Services

Appendix 8 Housing for Young Disabled People (HYDP)—Crippled Children's Association of South Australia.

1. Mater Dei Special School Community Residential Program

Mater Dei is a residential and day special school for up to 80 students with moderate-mild intellectual disabilities. The program includes both an elementary and secondary school, six community residential facilities, family support services and professional and administrative personnel.

Mater Dei commenced operation in 1957. Until 1971 students were accepted, from all States in Australia, and from Singapore, New Guinea and Noumea. Students were generally mildly or moderately intellectually disabled and a number had additional emotional or behavioural problems. Accommodation was provided at the school in large dormitories with communal bathrooms, dining and recreational rooms. Students were all female and classes were provided on campus. Visiting days were held monthly and students returned home at the end of each school term for holidays.

In 1971 a five-bedroom cottage was built on campus for older students. This cottage, staffed by a live-in residential worker, provided an opportunity for five senior students, in their last two years of schooling, to experience living in a small group, to acquire basic skills in self management and domestic skills and to participate in community-based activities including work experience.

In 1978 the school administration commissioned a review of the role and objectives of Mater Dei. This review examined all aspects of the program including enrolment policy, curriculum, accommodation, integration, family support, transition education and finances. As a result of the review a five-year plan was developed which resulted in the following innovations being achieved on target:

- the closure of the on-campus institutional accommodation and its replacement with cottages located in the nearby communities.
- the development of a comprehensive educational program for students, responsive to individual need, involving parents and family more closely.
- priority to the enrolment of local children who cannot for various reasons remain full time with their family (e.g. because of behavioural or family difficulties) and those who are not currently benefitting from placement in their regular school.
- boys are now accepted for enrolment.
- the majority of children return home on weekends. For those who cannot, a regular foster placement is arranged.
- a comprehensive family support service is provided and there is a close liaison between the school and the home.

- an integration program to provide pastoral or full integration of children into local regular schools is underway.
- a structured transition education program is in progress for older students, involving mainly work experience in the community.
- each residence is staffed by a live-in social educator who teaches independent and community living skills.

2. The T.R.A.I.L.S. Centre

T.R.A.I.L.S.—The Training Resources and Independent Living Skills Centre, was established in 1984. Its aim is to give support to intellectually handicapped youth, to enable them to participate in community based groups in Western Sydney.

A coordinator and two field workers are employed, as well as volunteers.

General Aim:

To give support to disabled people in integrating into the community.

Specific Aims:

Ongoing support and assistance for placement both to the community service and the disabled person.

To identify services and organisations which will assist in the participation of intellectually disabled people in the community; the areas include—education and training; vocational; recreational; social; transport.

To liaise with these groups and refer disabled people to them for placement.

To follow up placement with appropriate ongoing support and assistance to the disabled person and the service.

To act as an information centre for disabled people, their families, advocates and concerned professionals.

To initiate programs and services which will be of benefit to disabled people.

To promote the concept of integration with groups and residents of Western Sydney.

To act as an advocate for disabled people and their families when dealing with community and government organisations.

3. Work Preparation Programs

There are seven work preparation programs conducted by the Commonwealth Rehabilitation Service across Australia, each catering for an average of 50 mildly intellectually handicapped adolescents. The aims of the twelve-month program are to prepare these young people for work and independent living. The clients usually come straight from either a special school or a regular high school. Thus their service is effectively providing a tertiary level of education for these young people.

A variety of training models are in operation. The two original programs which commenced in 1973 (see Parmenter, 1980, for a full description) were established in a simulated factory environment and the vocational training was directed towards light industrial skills. Intensive group training was also given in social, interpersonal and independent living skills. A number of programs are still following this model.

In other programs, however, much of the training is conducted in the community, using enclaves, crews, and job on site training as methods of delivering these programs. Social and interpersonal skills training is integrated into the community programs. As each of the program models emerged to

meet local needs, there does not appear to be much difference between their various job placement and retention rates.

These programs have acted as a catalyst in the delivery of transition programs in Australia, having had an impact upon other service delivery organizations such as community colleges.

4. IMAC Service: A Pilot Project

What is IMAC (Integration, Maintenance, and Community Service)?

Integration, maintenance and community service is a pilot project currently funded under the community employment program. It is a new concept that utilises the least restrictive alternative premise for short-term training and employment of eight moderately developmentally disabled men and women. This is achieved by a small business cooperative that supplements existing community services. IMAC service offers a comprehensive home care service including garden maintenance, cleaning, laundry and other special services to the needy, aged and infirm in the local community.

It acknowledges the guidelines expressed under the Handicapped Persons Program Review, i.e. the need for 'domiciliary care—handymen and home help services' plus addressing the traditional 'lack of opportuinity for further education/training for persons in sheltered employment'.

Aims and Goals

The project aims to provide employees with the skills that will equip them to obtain and maintain competitive open employment, thus aiding their development of maximum economic and independent function. This is achieved within a framework of dual community benefit.

Firstly, the developmentally disabled people benefit from independent skills acquisition that complements personal independence. Major benefits are the reduction of complex tasks to be mastered separately for home and work, and the active facilitation of skills transfer from setting to setting—both well documented problem areas in habilitation of the developmentally disabled. Because the project is community based and meets real community service needs, employees' self esteem and community awareness are heightened.

Secondly, aged or otherwise handicapped persons currently residing in their own homes have access to service which *is not* currently provided by other service agencies and thus they can continue to function in the community. Their self esteem is also heightened by their facilitation of the potential of developmentally disabled employees.

All those who have contact with the service benefit by developing a more positive and realistic understanding of intellectual disability. By assisting developmentally disabled people to become service providers instead of social burdens the community is forced to reassess traditionally held values of worth. Both employees and clients are thus provided with an alternative to the more costly, socially and financially, solution of institutionalization and segregated service.

5. The C.J. Coles Venture

Project Employment (Inc) is a Western Australian based non-profit employment agency for intellectually disabled persons. In addition to offering access to open employment, Project Employment also provides comprehensive on-the-job training subsequent to placement. Project Employment Services are available to any intellectually disabled person—regardless of severity of disability—who is motivated to work in open employment.

Project Employment (Inc) is actively involved in developing new avenues to open employment for intellectually disabled workers. Reports of placement rates from around the world suggest that conventional transitional strategies are not adequate. In addition to adopting more aggressive marketing tactics, service providers need also to generate new 'foot in the door' approaches to open industry.

One such approach is 'Repeat Business'. The tactic behind Repeat Business is to negotiate a single position with a large corporation. Once secured, a worker is selected who is likely to rise most rapidly to full production. The rationale underlying this decision is to positively enhance the image of intellec-

tually disabled workers at the earliest opportunity. Once placed, the support agency allocates generous training and supervision resources to further enhance the images of both the worker and the agency. With a solid track record established, the agency is in a strong position to bid for any new vacancies that arise in related positions within the corporation. Using such tactics, Project Employment has increased its penetration of the C.J. Coles Supermarket chain in Perth, Western Australia, from one to eight fully paid positions in seven months. When vacancies now arise in the areas of shopping cart collection or parcel pick-up, Coles approaches Project Employment with an offer to fill the vacancy.

6. The Epilepsy Association of South Australia's Training and Placement Service

The Epilepsy Association of South Australia's (EASA) Training and Placement Service (TAPS) was established in May 1983 with funding from the Commonwealth Department of Employment and Industrial Relations (DEIR).

TAPS was designed to be a work preparation program for persons suffering from epilepsy who were:

- 16 years of age and over
- unemployed
- assessed as having the capacity to obtain open employment
- assessed as having a commitment to obtain open employment
- registered with the CES

Under the terms of a formal agreement between EASA and DEIR (The Program funding body) the aims of the Program were designed to:

a. Prepare participants for open employment through:
   - personal independence (ability to take care of self).
   - interpersonal independence (ability to relate to authority and peers).
   - environmental independence (ability to negotiate general and community services).
   - advancement of educational standards.
   - job seeking skills (ability to negotiate vocational environment).
   - on-the-job and other appropriate vocational training.

b. Locate employment opportunities by exploring, identifying and developing areas of vocational opportunity.

c. Place participants in open employment and provide appropriate follow-up support.

TAPS staff include a Program Director, Job Development Officer, Psychologist, Group Worker, Social Worker and Program Assistant.

7. Active Job Services

Active Job Services was launched in August, 1984, as a self help employment service for people who are disabled in the Sydney metropolitan area. The project is innovative because all of its nine employees will be people who are disabled and who will be developing and applying job acquisition skills to the real needs of disabled people throughout the metropolitan area. Further, Active Job Services is not tied to any particular Government, Rehabilitation service or Agency, (although it enjoys the support of all of these groups) and it will offer a range of services previously unavailable for its client group.

Active Job Services was sponsored for Community Employment Program (CEP) funding by the Employment of People with Disabilities Interagency (EPDI). EPDI held its inaugral meeting on 24th February, 1983, and its overall aims are as follows:

- Maximise job opportunities for people with disabilities.

- Provide a forum for the discussion of the employment related needs of people with disabilities and to develop the mechanisms for satisfying these needs where possible.
- Examine Government and corporate recruitment policies and practices impact on disabled job seekers; and to discuss and seek to change these where EPDI consider necessary.
- Seek out specialists in manpower planning and research. Broaden our members' knowledge of the current and emerging job scenes as they affect disabled workers.
- Stimulate the maximum input from disabled individuals and groups in EPDI.

Active Job Services was initially funded by the CEP for fifty two weeks which means that it cannot employ participants for more than twelve months, nor can it be guaranteed of whole or partial funding from that source.

8. Housing for Young Disabled People (HYDP)—Crippled Children's Association of South Australia.

This program provides training and experience in independent living for young people 18 years or older who have physical disabilities. A key feature of the program is the use of care attendants for providing support and assistance. It utilizes training houses and flats in the suburbs of Adelaide. They are typical suburban dwellings, physically accessible and located near needed services and resources.

Residents are expected to take maximum responsibility for their lives and to participate in the decision making processes of the household. The age range of the residents is 18 to 35 years, with an average age of 23 years. Both sexes participate in the program and can remain up to 12 months in the initial training houses. Applicants must be able to manage with three hours or less care assistance per day.

The initial training house is staffed by a live-in residential care worker who oversees the work of the care attendants, acts as a back-up and resource person and generally ensures the smooth running of the household.

Strategies for promoting independence

The following five areas are identified as crucial components in promoting the independence of each resident:

a. Motivation
Prospective residents are screened and assessed for their motivation to gain further competence and independence in their daily lives. The resident is expected to take responsibility for how he or she utilises the care attendant and for how the day is organised. Support and counselling is provided to assist the resident in maintaining high motivation to achieve his or her goals.

b. Aids to daily living
Residents require a range of resources in order to perform daily tasks. The HYDP assesses each resident's need for special aids and resources and assists residents in obtaining these.

c. Skills of self-direction
In order to equip residents with the skills to cope in more independent settings and to effectively respond to various situations, residents are encouraged to make their own decisions and to live with the consequences. These situations include decisions about leisure time, money, work, relationships, room management and how the attendant care resource is best used.

d. Networks
Residents are encouraged and assisted to develop social networks and friendships to assist in the maintenance of a healthy self-concept. The HYDP program recognises that everyone is in fact interdependent. The more meaningful the links are, the more successful the individual will be in coping with the demands of everyday life.

e. Community resources
Residents in the program are assisted in accessing meaningful and valued community activities and resources. However the decision as to what activities the resident wishes to engage in is left completely up to the resident to determine.

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